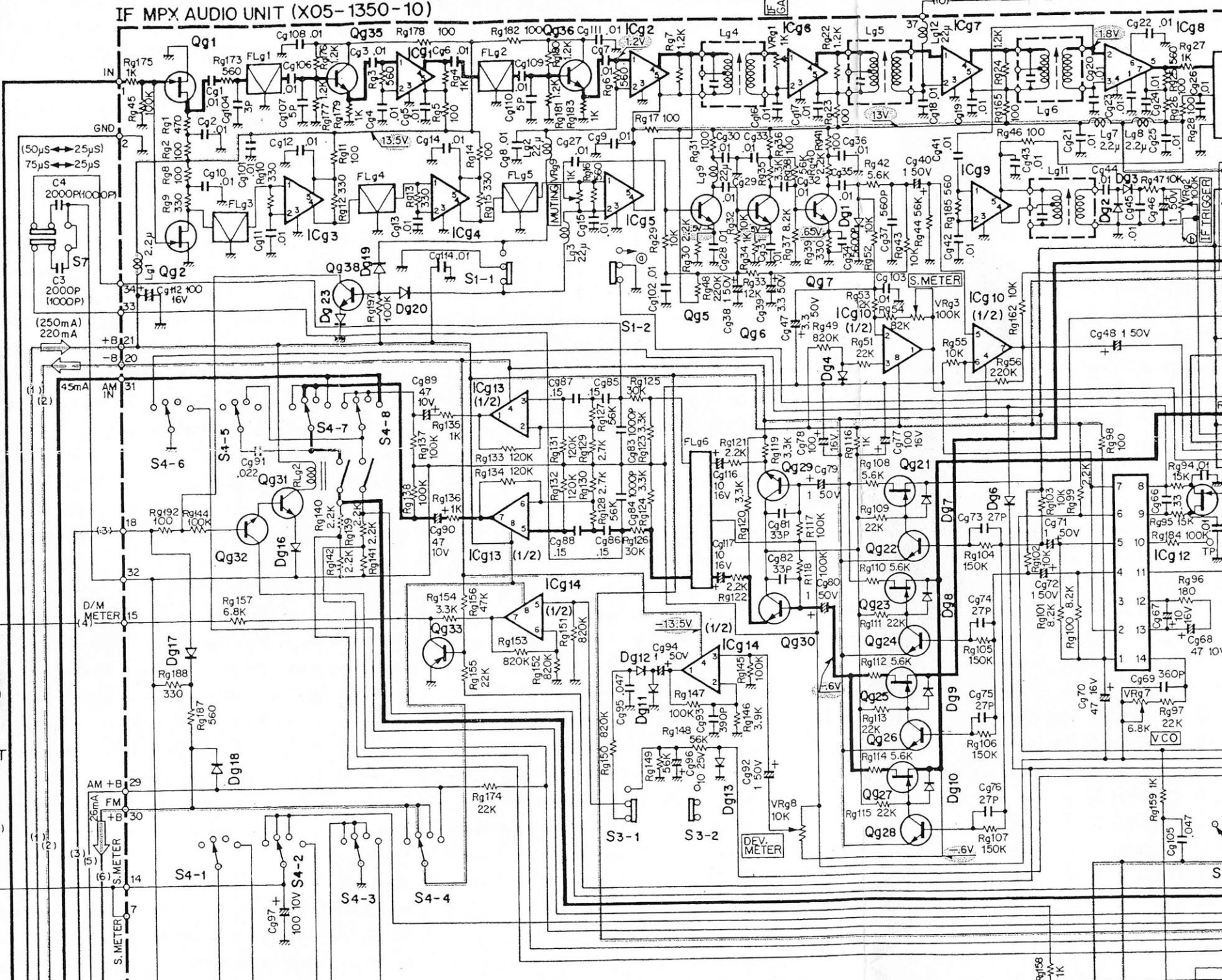
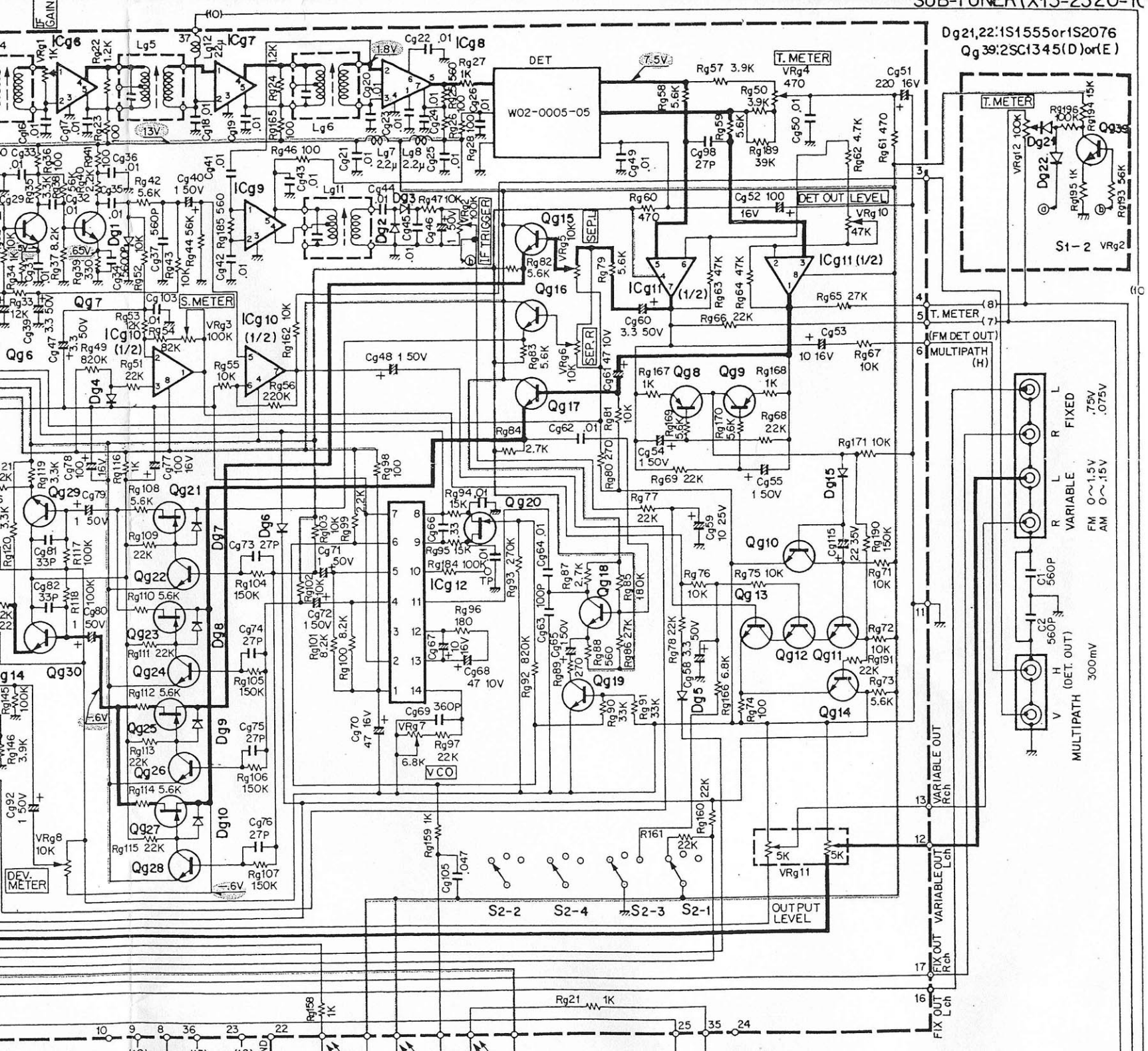
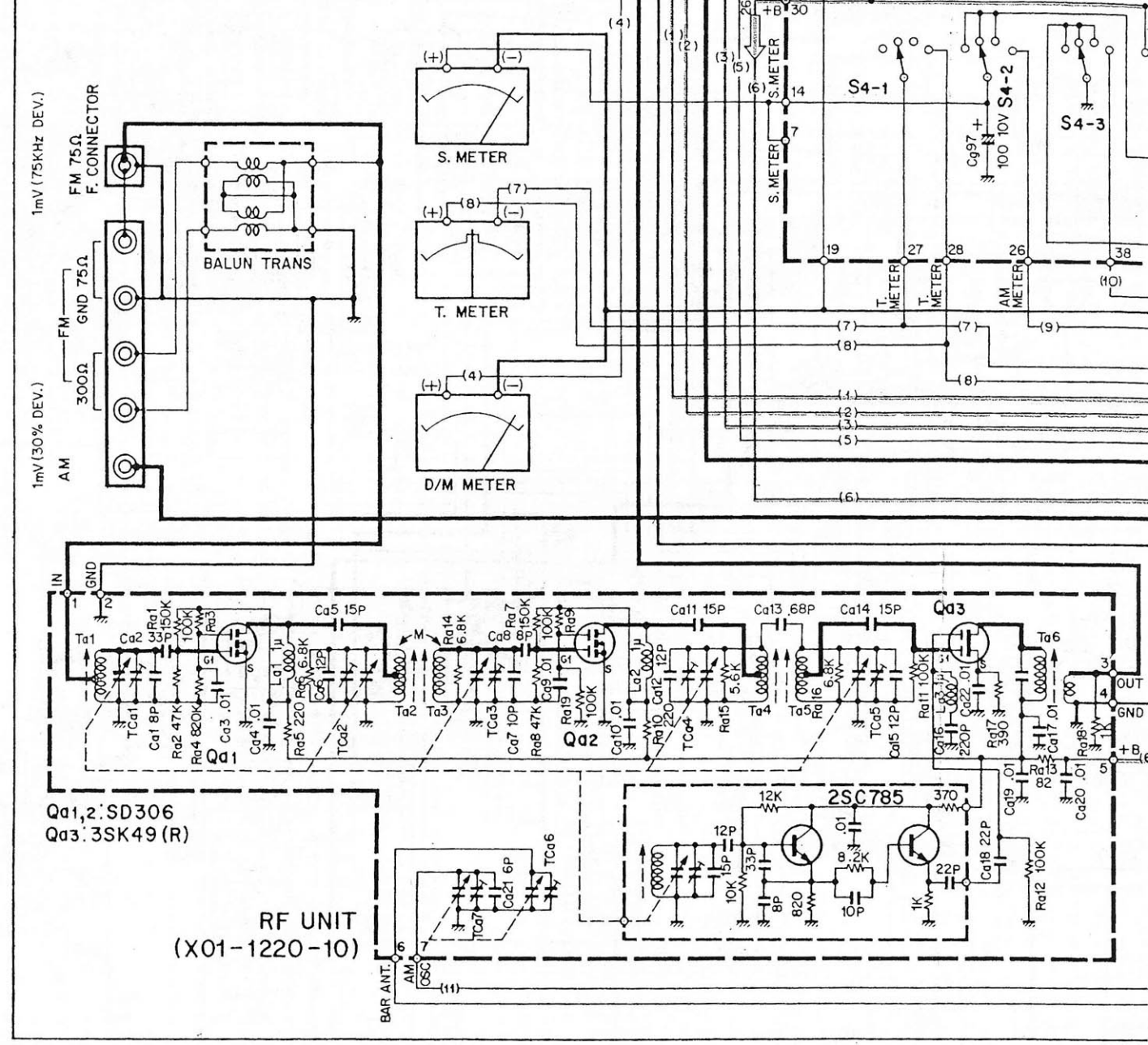

IF MPX AUDIO UNIT (X05-1350-10)
IN
GND
(50μS←→25μS)
75μS←→25μS
C4 2000P(1000P)
S7
C3 2000P (1000P)
(250mA) 220mA
+B 21
-B 20
45mA
AM IN 31
D/M METER 15
AM +B 29
FM +B 30
26mA
S.METER 14
S.METER 7
S4-1
S4-2
S4-3
S4-4
S4-5
S4-6
S4-7
S4-8
S1-1
S1-2
S3-1
S3-2
DEV. METER
S.METER
VCO
IF TRIGGER
MUTING
13.5V
13V
1.8V
-13.5V
-6V
Qg1
Qg2
Qg5
Qg6
Qg7
Qg16
Qg17
Qg18
Qg19
Qg20
Qg21
Qg22
Qg23
Qg24
Qg25
Qg26
Qg27
Qg28
Qg29
Qg30
Qg31
Qg32
Qg33
Qg35
Qg36
Qg38
ICg1
ICg2
ICg3
ICg4
ICg5
ICg6
ICg7
ICg8
ICg9
ICg10
ICg12
ICg13
ICg14
FLg1
FLg2
FLg3
FLg4
FLg5
FLg6
Lg1
Lg3
Lg4
Lg5
Lg6
Lg7
Lg8
Lg9
Lg11
Lg12
Dg1
Dg2
Dg3
Dg4
Dg6
Dg7
Dg8
Dg9
Dg10
Dg11
Dg12
Dg13
Dg17
Dg18
Dg19
Dg20
Dg23


SUB-TUNER(X13-2320-1
Dg21,22:1S1555or1S2076
Qg39:2SC1345(D)or(E)
IF GAIN
ICg6
ICg7
ICg8
ICg9
ICg10 (1/2)
ICg11 (1/2)
ICg12
DET
W02-0005-05
7.5V
T. METER
VRg4 470
S. METER
IF TRIGGER
SEP.L
SEP.R
DET OUT LEVEL
VRg10 47K
Qg15
Qg16
Qg17
Qg6
Qg7
Qg8
Qg9
Qg10
Qg11
Qg12
Qg13
Qg14
Qg18
Qg19
Qg20
Qg21
Qg22
Qg23
Qg24
Qg25
Qg26
Qg27
Qg28
Qg29
Qg30
Dg1
Dg2
Dg3
Dg4
Dg5
Dg6
Dg7
Dg8
Dg9
Dg10
Dg15
VCO
VRg7
DEV. METER
VRg8 10K
VRg11 5K 5K
OUTPUT LEVEL
S2-2 S2-4 S2-3 S2-1
T. METER
VRg12 100K
Dg21
Dg22
S1-2 VRg2
(FM DET OUT)
MULTIPATH (H)
MULTIPATH (DET. OUT) 300mV
R L FIXED .75V .075V
R L VARIABLE FM 0~1.5V AM 0~.15V
V H
VARIABLE OUT Rch
VARIABLE OUT Lch
FIX OUT Rch
FIX OUT Lch
+8V
13V
-6V
-.6V


1mV (75KHz DEV.)
FM 75Ω F. CONNECTOR
FM
GND 75Ω
300Ω
AM
1mV (30% DEV.)
BALUN TRANS
S. METER
T. METER
D/M METER
S4-1
S4-2
S4-3
S. METER
+B
Cg97 100 10V
T. METER
T. METER
AM METER
IN
GND
OUT
GND
+B
Qa1
Qa2
Qa3
Qa1,2: SD306
Qa3: 3SK49 (R)
2SC785
RF UNIT
(X01-1220-10)
BAR ANT.
AM OSC

KENWOOD

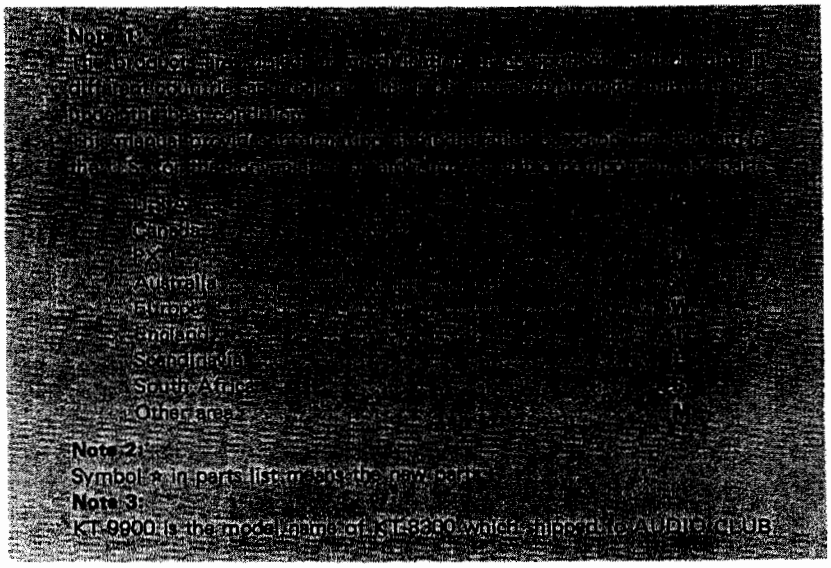
HI/FI STEREO COMPONENTS

SERVICE MANUAL

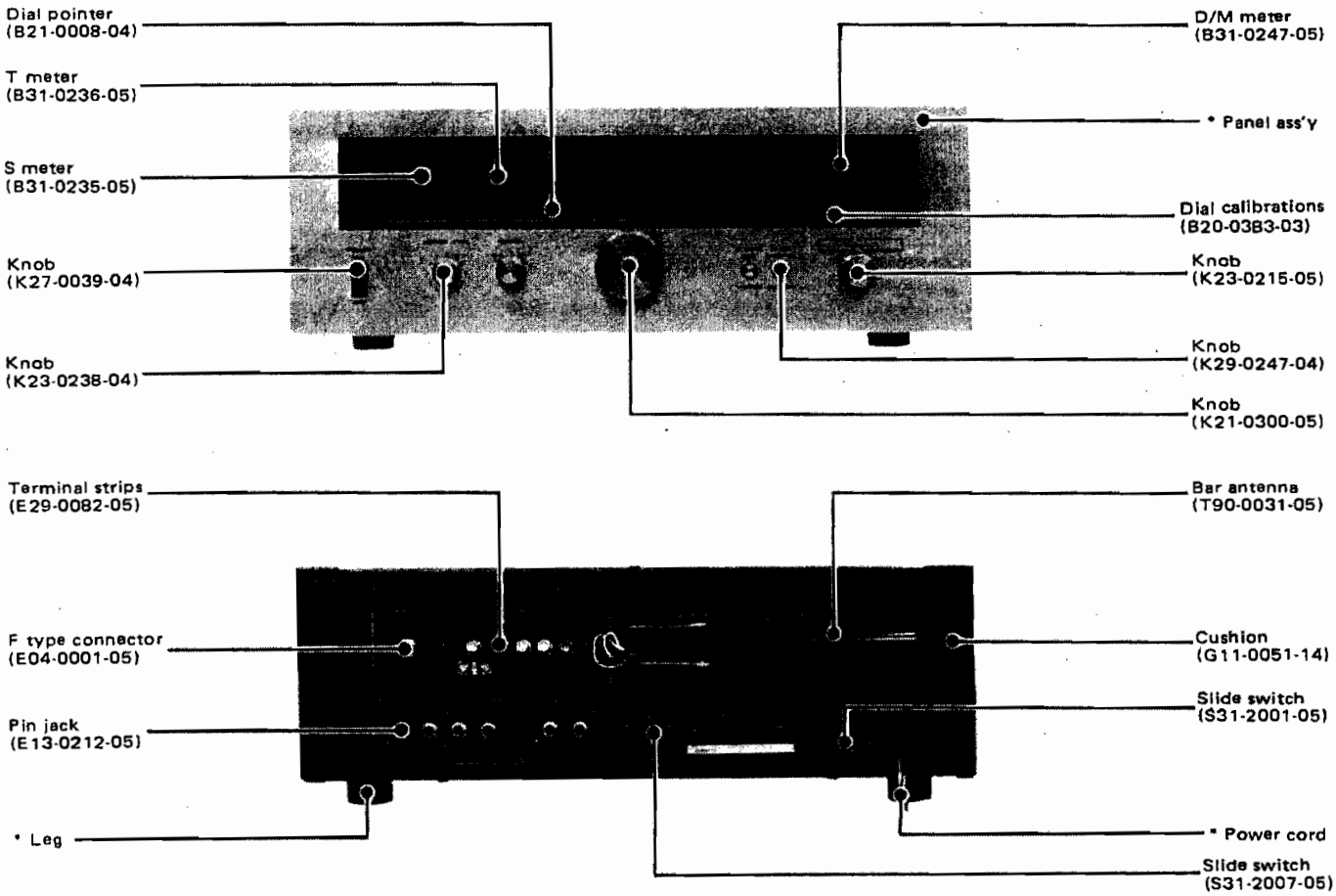
KT-8300
(KT-9900)

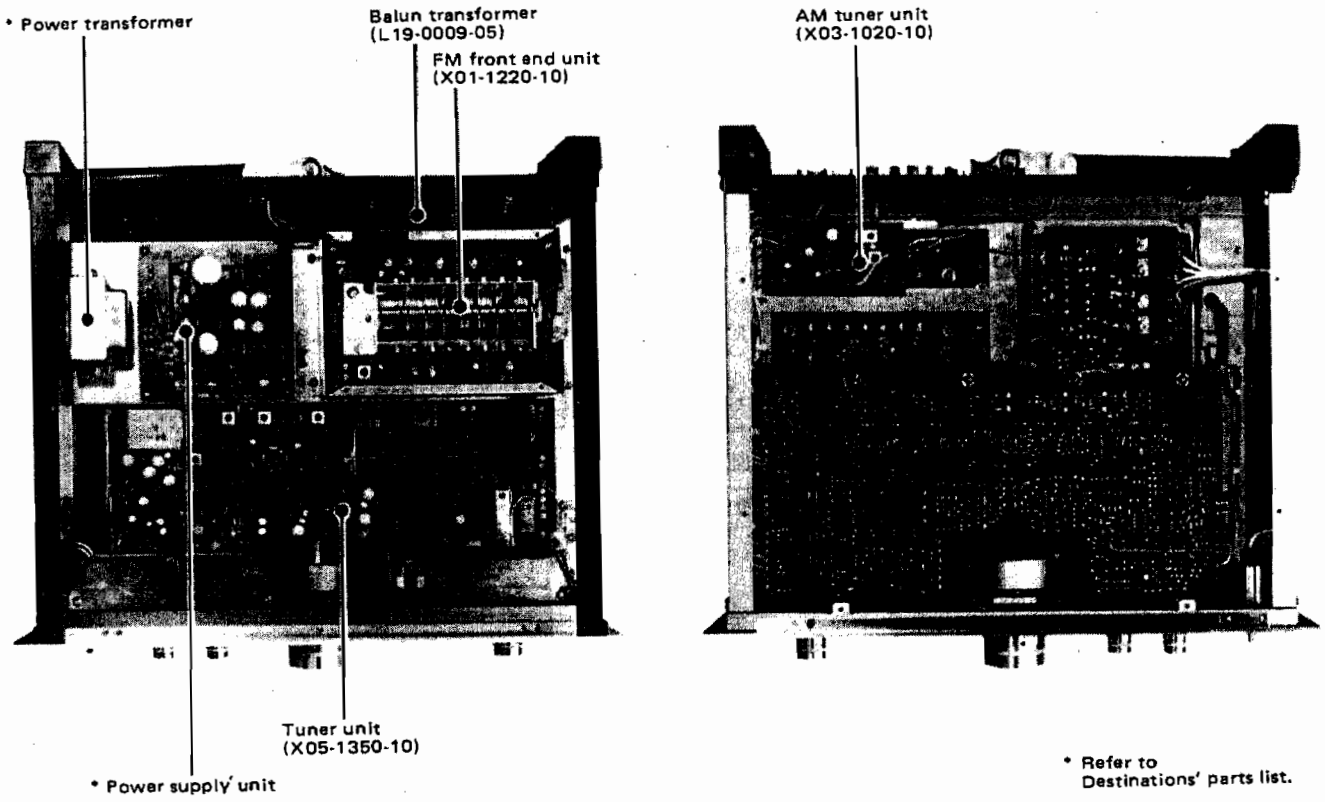
AM-FM STEREO TUNER

CONTENTS



EXTERNAL & INTERNAL VIEW



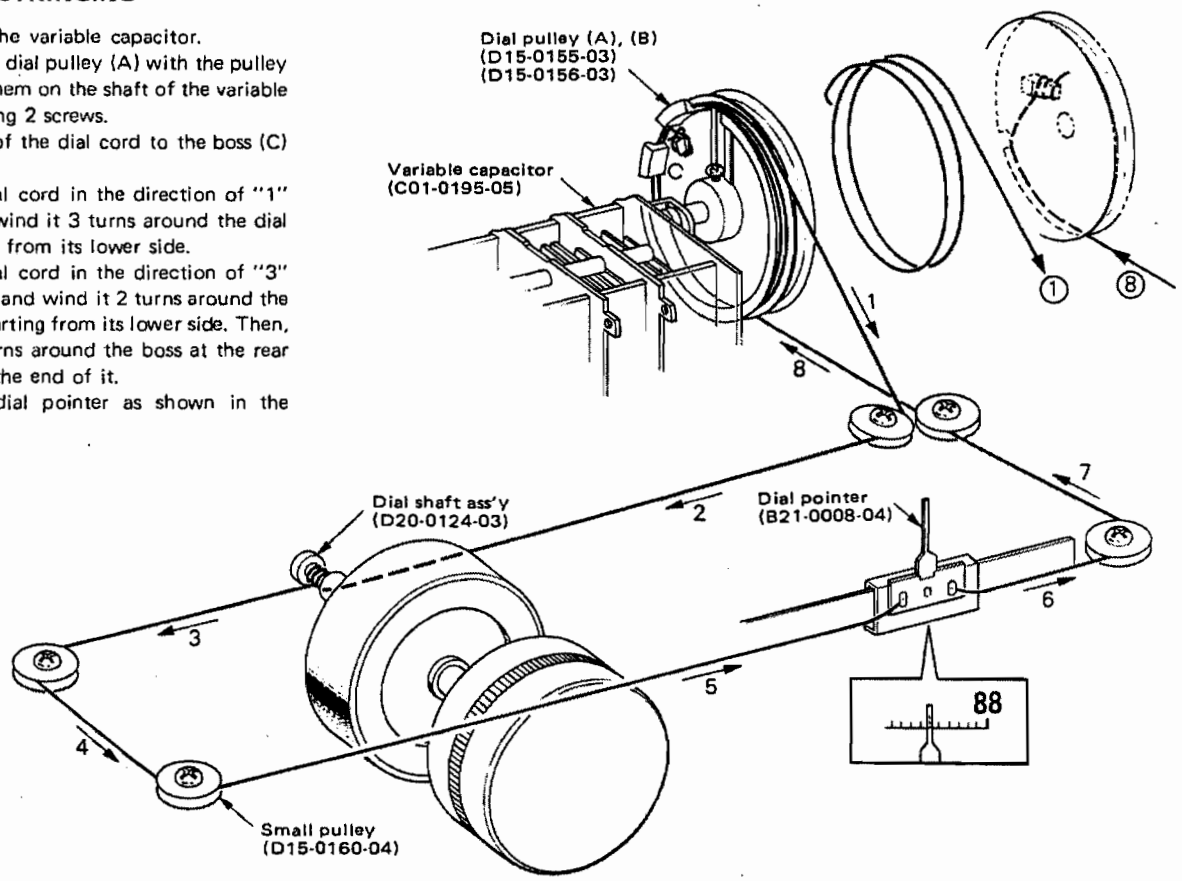


* Refer to Destinations' parts list.

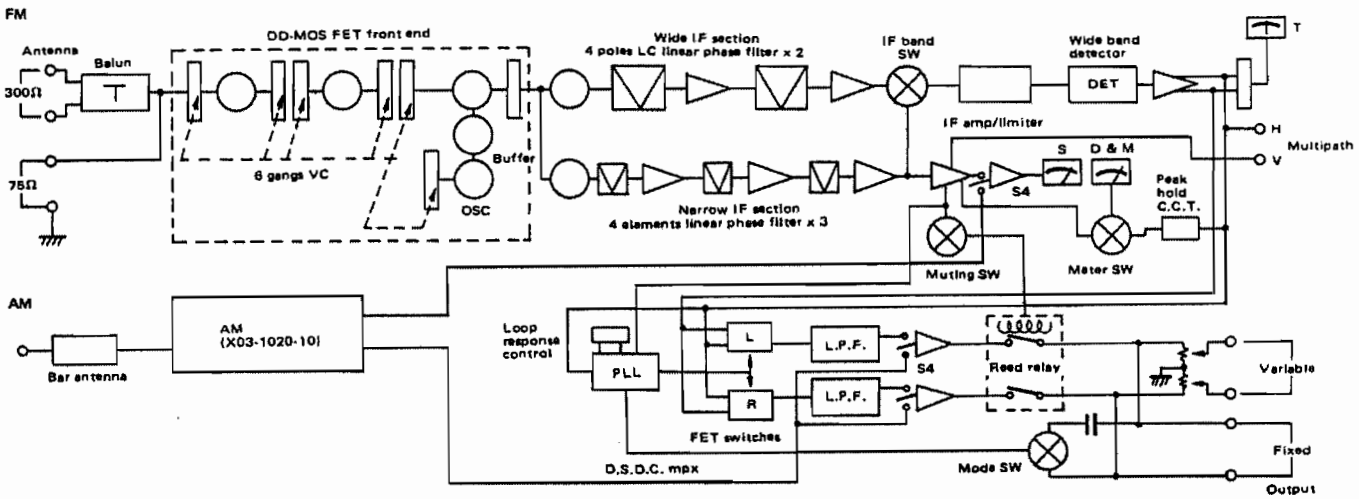
DIAL CORD STRINGING/BLOCK DIAGRAM

DIAL CORD STRINGING

1. Fully close the variable capacitor.
2. Assemble the dial pulley (A) with the pulley (B) and fix them on the shaft of the variable capacitor using 2 screws.
3. Tie the end of the dial cord to the boss (C) as shown.
4. Dress the dial cord in the direction of "1" to "2" and wind it 3 turns around the dial shaft starting from its lower side.
5. Dress the dial cord in the direction of "3" through "8" and wind it 2 turns around the pulley (B) starting from its lower side. Then, wind it 2 turns around the boss at the rear side and tie the end of it.
6. Mount the dial pointer as shown in the illustration.



BLOCK DIAGRAM



CIRCUIT DESCRIPTIONS

FM-RF (X01-1220-10)

1. ADOPTION OF DD TYPE DUAL GATE MOS-FET (Qa1, Qa2)

The RF amplifier employs DD (Double-Diffused) type MOS-FET elements. This type of FET has been processed through diffusion repeated twice, and hence it offers a better high-frequency characteristic and a shorter channel length to be controlled by gate potential. The noteworthy features are (1) preferable large-input characteristic, (2) preferable spurious response and mutual modulation characteristics, (3) sensitivity with low noise figure (NF), and (4) stabilized performance with a small feedback capacity.

2. ADOPTION OF HIGH-ACCURACY 6-GANG VARIABLE CAPACITOR

The high-frequency selective circuit is composed of single-double-double tuning stages. Such a multistage type circuit may often result in degradation of distortion factor. However, this tuning circuit with an optimum Q has been designed by the adoption of a high-accuracy 6-gang variable capacitor with minimal tracking and gang errors, and by the reduction of load capacity realized by DD type MOS-FET. Thus, preferable image rejection, spurious response, and IF interference characteristics are obtained without sacrificing distortion characteristics.

3. MIXER WITH MOS-FET (Qa3)

A dual gate MOS-FET is employed to suppress mutual modulation in the mixing stage.

4. LOCAL OSCILLATOR

A buffer circuit assures the stabilized supply of local oscillation output to the mixer so that the characteristics for AM suppression and cross-modulation can be improved. Since the local oscillator is joined with the variable capacitor, there is no error between actual setting and circuit operation.

TUNER (X05-1350-10)

FM-IF

The IF circuit can be switched over to NARROW or WIDE. The wide-band circuit is composed of Qg1, FLg1, Qg35, ICg1, FLg2, Qg36, ICg2, and Lg4. FLg1 and FLg2 are a 4-pole LC concentrated filter having a ideal group-delay characteristic. Qg35 and Qg36 compose an emitter-follower circuit which prevents deterioration of group-delay characteristic when a large input is applied.

The narrow-band circuit is composed of Qg2, FLg3, ICg3, FLg4, ICg4, FLg5, ICg5, and Lg4. FLg3, FLg4, and FLg5 are a 4-element phase linear type ceramic filter with excellent group-delay characteristics. These make it possible to obtain a selectivity of 110 dB. Switching over between NARROW and WIDE is effected by switching on ICg2 or ICg5. (This selection is possible with S1.) ICg2 or ICg5 is switched off when No. 2 terminal is grounded. After passing through the wide band or narrow band circuit, the 10.7 MHz IF signal is amplified at ICg6, ICg7, and ICg8, and then transmitted to the DET circuit.

Function of Qg38: When the IF circuit is switched over either to NARROW or WIDE, the muting circuit is switched on to suppress shock noise.

FM-DET

The detector circuit is assembled into a unit (W02-0005-05). It is a wide-band detector circuit of multicative detection system. This system is composed of phase shifter, wave shaping circuit, and multiplier having a low distortion characteristic. The detection band width is 5 MHz and a low distortion characteristic of 0.04% is realized over more than 1 MHz range. SN ratio is more than 85 dB. This detector circuit generates balanced output.

FM-MPX

The balanced output from the detector circuit is amplified by ICg11 and the main signal is fed to DSDC (Double switching demodulator circuit) through emitter-follower Qg17. The sub-signal for left channel passes through emitter-follower Qg15 and that for right channel passes through emitter-follower Qg16, both fed to DSDC. In this way, the newly designed DSDC cancels the leak components of right and left demodulators with exclusively installed canceling circuits. Adjustment for channel separation is independently performed at right and left circuits. Therefore separation for both channels can be adjusted to optimum values respectively.

As an analog switch, an excellent FET is used for MPX demodulator switching to obtain low distortion factor and high separation characteristic. This FET switching system is put to practical use by uniquely-designed FET driving circuit. Distortion factor of this circuit is less than 0.02% in monaural and less than 0.05% in stereo reproduction. Qg22, Qg24, Qg26, and Qg28 repeat on-off performance at 38 kHz to obtain the function of FET switching. Dg7 ~ 10 are used for the improvement of distortion characteristics.

CIRCUIT DESCRIPTIONS

The 38 kHz switching signal is generated by ICg12. The composite signal is amplified at Qg18 and applied to No. 11 terminal of ICg12. The 38 kHz sub-carrier signal is obtained from No. 4 and 5 terminals. A pilot signal is taken out of the composite signal by the aid of filter function of PLL. However, if the loop response is too fast, this filter function will be weakened and the sub-carrier will be mixed with main- and sub-signals, thus giving rise to a sort of cross-modulation distortion. Most part of distortion in the high-frequency range during stereo reproduction is caused by this phenomenon. Also in the low-frequency range, there will be a peak distortion in the vicinity of 200 Hz due to jitter in PLL (phase difference by LPF leakage). In order to eliminate high-frequency and jitter distortions, the input level of PLL (No. 11 terminal) is lowered after the stereo indicating lamp has been lit up. This delays the loop response (capture range narrowed), and increases the filter effect. In practical usage, emitter resistance of Qg18 is changed by Qg19 to give variation in amplification degree. In this manner, the amount of composite signal into ICg12 is increased or decreased. Qg19 is turned off while broadcast signals are received.

AUDIO AMP

The audio signals demodulated for the right and left channels enter the emitter-follower circuit of Qg29 or Qg30. After a carrier leak has been removed at low-pass filter FLg6, these signals are amplified at the final amplifier of ICg13 and generated as tuner output.

ACCESSORY CIRCUITS

1. S METER (FM)

A signal for the S meter passes through the AGC AMP of Qg5 ~ 7, is amplified at 1/2 ICg10, and is detected at Dg5. Indication is almost linear up to 1 mV while the SN ratio is completely saturated.

2. MULTIPATH METER

A signal for the multipath meter is amplified at 1/2 ICg10 and detected at Dg13. This meter is used to detect the AM component in 10.7 MHz IF signal and to supervise the amount of multi-path.

3. DEVIATION METER

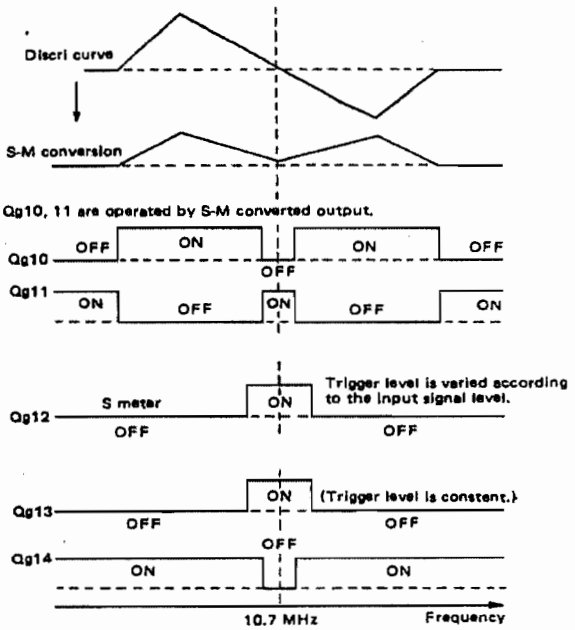
The peak value of modulation is indicated by percentage, regarding deviation of 75 kHz as 100%. The composite signal is amplified at ICg14 and detected at Dg11 and Dg12. The obtained output is used to give deflections at the deviation meter. Qg33 is used to prevent the deflection at the muting level or lower.

4. T METER

A difference in balanced outputs (in reverse phase) from the multicative detector (W02-0005-05) is used to give deflections at the T meter.

5. MUTING

The muting control signal is obtained from the AND circuit by utilizing the following 3 signals: (1) signal for deflecting the S meter (varied with input level), (2) signal from IF circuit, and (3) signal obtained from the S curve of DET through S-M conversion.
When the signal of (1) above is obtained, Qg12 is turned on. The signal of (2) is the detection output obtained from the circuit consisting of ICg9, Lg11, Dg2, and Dg3. This signal causes Qg13 to be turned on. The signal of (3) is obtained from the S curve of DET through S-M conversion effected by the phase detector circuit consisting of Qg8 and Qg9. With this signal, Qg10 is turned off and Qg11 is turned on when broadcast signals are received. Qg14 is turned off when all of Qg11 ~ 13 are turned on. It clears the muting function. If at least one of Qg11 ~ 13 is turned off, Qg14 is turned on and the muting function is obtained.
Qg31 and Qg32 are used to compose a relay driving circuit which can be switched on or off by a muting control signal or by a signal which can be obtained after the set has been energized (rectified signal from Dk3).
The muting circuit can be set to either of the two purposes. It can be used for the major purpose of inter-station noise suppression, or when a high-quality station (SN ratio being 50 dB or higher) is selected for stereo reception.



ADJUSTMENTS

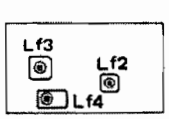
TEST EQUIPMENTS

RF signal generator ..... RF-SG
Oscilloscope ..... scope
Solid state volt meter (input impedance: more than 1MΩ.. SSVM
DC volt meter ..... DCVM
FM stereo generator ..... MPX-SG
Frequency counter
Distortion meter

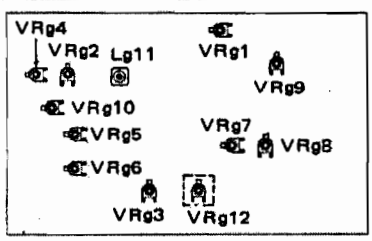
NOTE

* Tuning dial is set to the proper point corresponding to no radio stations.
* RF-SG is set to the lower response possible on oscilloscope.
* The output level of RF-SG is made a 6 dB drop by the dummy ant.
* The input level 60 dB means 66 dB on RF-SG.
* Repeat TRACKING adjustment several times and confirm the reception of broadcasting.
* Test point is shown in the schematic diagram.

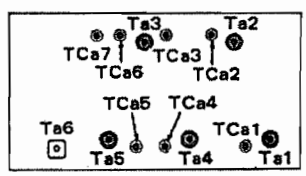
No.	ALIGN	TEST EQUIPMENTS		TUNER SETTING	OUTPUT INDICATOR	ADJUSTMENT POINTS	REMARKS
		CONNECTION	SETTING				
FM SECTION							
1	DISCRIMINATOR	–	–	–	T meter	VRg4	Make the pointer position in the center of the meter (at Narrow mode)
						VRg12	Make the pointer position in the center of the meter (at Wide mode)
2	TRACKING	RF-SG to ANT terminal via dummy ant.	90 MHz 1 kHz (Mod) 75 kHz (Dev)	90 MHz	SSVM, distortion meter & scope to output jack (L)	Ta1 ~ 5	Maximum deflection, minimum distortion
3			105 MHz 1 kHz (Mod) 75 kHz (Dev)	105 MHz		TCa1 ~ 5	
4	Repeat "DISCRIMINATOR" adjustment						
5	IF TRIGGER	RF-SG to ANT terminal via dummy ant.	100 MHz 0 (Dev) 60 dB	100 MHz	DCVM to TP1	Lg11	Maximum DC voltage
			100 MHz 0 (Dev) 10 dB	- ditto -	- ditto -	Ta6	Maximum DC voltage
6	IF TRIGGER LEVEL	- ditto -	100 MHz 0 (Dev) 60 dB	- ditto -	- ditto -	VRg2	Adjust DC voltage to 1.8 V
7	IF GAIN	–	–	–	- ditto -	VRg1	Adjust DC voltage to 0.6 V
8	S METER	RF-SG to ANT terminal via dummy ant.	100 MHz 0 (Dev) 60 dB	100 MHz	S meter	VRg3	Make the pointer indication "5" digit
9	MUTING LEVEL	- ditto -	100 MHz 0 (Dev) 16 dB	- ditto -	SSVM & scope to output jack (L)	VRg9	Adjust VRg9 so that muting operation is on
10	VCO	–	–	–	Frequency counter to TP2	VRg7	Adjust VCO frequency to 19 kHz
11	OUTPUT LEVEL	- ditto -	100 MHz 1 kHz (Mod) 75 kHz (Dev) 60 dB	100 MHz	SSVM & scope to FM DET OUT	VRg10	Adjust OUTPUT LEVEL to 300 mV
12	SEPARATION	RF-SG to ANT terminal MPX-SG to RF-SG ext. Mod.	MPX-SG: SELECTOR → L or R 1 kHz (Mod) RF-SG: 100 MHz, 60 dB 68.25 kHz (Dev)	- ditto -	SSVM & scope to output jack (R)	VRg6	Minimum deflection
					SSVM & scope to output jack (L)	VRg5	Minimum deflection
13	DISTORTION	- ditto -	MPX-SG: SELECTOR → L + R 1 kHz (Mod) RF-SG: 100 MHz, 60 dB 75 kHz (Dev)	- ditto -	SSVM, scope & distortion meter to output jack (L)	Ta6	Minimum distortion
14	DEVIATION METER	RF-SG to ANT terminal via dummy ant.	100 MHz 1 kHz (Mod) 75 kHz (Dev) 60 dB	- ditto -	D meter	VRg8	100% deflection
AM SECTION							
1	IF	RF-SG to ANT terminal via dummy ant.	1000 kHz 400 Hz, 30% (Mod) 100 dB	1000 kHz	SSVM & scope to output jack (L)	Lf4	Maximum deflection
2	TRACKING	- ditto -	600 kHz 400 Hz, 30% (Mod) 100 dB	600 kHz	- ditto -	Lf3 Bar antenna	- ditto -
3			1400 kHz 400 Hz, 30% (Mod) 100 dB	1400 kHz		TCa6, 7	



AM UNIT
(X03-1020-10)



FM TUNER
(X05-1350-10)



RF UNIT
(X01-1220-10)

☆ : new parts

Ref. No.	U.S.A. (K)	Canada (P)	PX (U)	Australia (X)	Europe (W)	Scandinavia (L)	England (T)	Other Area (M)	KT-9900 (M2)	Description
C3, 4	CQ09S1H-202G(B)	CQ09S1H-202G(B)	CQ09S1H-202G(B)	–	–	–	–	CQ09S1H-202G(B)	CQ09S1H-202G(B)	Polystyrene capacitor 2000pF ±2%
C3, 4	–	–	–	CQ09S1H-102G(B)	CQ09S1H-102G(B)	CQ09S1H-102G(B)	CQ09S1H-102G(B)	–	–	Polystyrene capacitor 1000pF ±2%
–	A20-1060-02	A20-1060-02	A20-1060-02	A20-1060-02	A20-1060-02	A20-1060-02	A20-1060-02	A20-1060-02	A20-1078-02	Panel ass'y ☆
–	A30-0110-02	A30-0110-02	A30-0110-02	A30-0110-02	A30-0110-02	A30-0110-02	A30-0111-02	A30-0110-02	A30-0112-02	Dial board ☆
–	B46-0056-00	B46-0055-10	B46-0050-00	–	–	–	–	–	–	Warranty card
–	–	–	B46-0051-00	–	–	–	–	–	–	Warranty card
–	B50-1513-00	B50-1513-00	B50-1513-00	B50-1513-00	B50-1513-00	B50-1513-00	B50-1514-00	B50-1513-00	B50-1545-00	Instruction manual ☆
–	–	–	B59-0018-00	–	–	–	–	–	–	Kenwood service stations' list
–	D32-0075-04 x 1	D32-0075-04 x 1	D32-0075-04 x 2	D32-0075-04 x 2	D32-0075-04 x 2	D32-0075-04 x 1	D32-0075-04 x 1	D32-0075-04 x 2	D32-0075-04 x 2	Switch stopper
–	E29-0047-04	–	–	–	–	–	–	–	–	Lead hold for bar antenna
–	E30-0181-05	E30-0181-05	E30-0545-05	E30-0185-05	E30-0459-05	E30-0292-05	040-0304-05	E30-0545-05	E30-0545-05	Power cord
–	H01-1589-14	H01-1590-14	H01-1597-14	H01-1589-14	H01-1589-14	H01-1589-14	H01-1591-14	H01-1589-14	H01-1592-14	Carton case
–	H20-0394-04	H20-0394-04	H20-0394-04	H20-0394-04	H20-0394-04	H20-0394-04	H20-0394-04	H20-0416-04	H20-0394-04	Polyethylene cover
–	–	–	–	–	–	–	–	H40-0004-04	–	Rust preventing paper
–	J02-0073-04	J02-0049-14	J02-0049-14	J02-0049-14	J02-0049-14	J02-0049-14	J02-0049-14	J02-0049-14	J02-0049-14	Leg x 4
–	J41-0034-05	J41-0034-05	J41-0034-05	J41-0024-15	J41-0033-05	J41-0033-05	J41-0024-15	J41-0034-05	J41-0034-05	Power cord bushing
–	–	–	–	–	–	J61-0038-05	J61-0038-05	–	–	Cord band
–	L01-1141-05	L01-1141-05	L01-1145-05	L01-1145-05	L01-1146-05	L01-1142-05	L01-1147-05	L01-1145-05	L01-1145-05	Power transformer
S5	S33-2008-15	S33-2016-05	S33-2008-15	S33-2008-15	S33-2017-05	S33-2017-05	S33-2017-05	S33-2016-05	S33-2008-15	Lever switch (POWER)
–	–	–	S31-2001-05	–	–	–	–	S31-2001-05	S31-2001-05	Slide switch (Power voltage selector)
–	X00-1760-11	X00-1760-11	X00-1760-00	X00-1760-00	X00-1760-61	X00-1760-61	X00-1760-61	X00-1760-00	X00-1760-00	Power supply unit

PARTS LIST

☆ : new parts

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
C1, 2	CK45D1H561M	Ceramic 560pF ±20%	
		SEMICONDUCTOR	
CN1~3	V11-0392-05	LED GD-4-203CD x 3	
		SWITCH	
S6	S31-2001-05	Slide (DIMMER)	
S7	S31-2007-05	Slide (DE-EMPHASIS)	
		MISCELLANEOUS	
–	A48-0027-03	Side plate x 2	
–	A52-0016-03	Top plate	
–	B07-0162-04	Ring x 2	
–	B10-0204-03	Front glass	☆
–	B19-0192-04	Lighting acryl resin board	☆
–	B19-0193-04	Lighting acryl resin board	☆
–	B20-0383-03	Dial calibrations	☆
–	B21-0008-04	Dial pointer	
–	B30-0116-05	Pilot lamp(8V 300mA fuse type)x2	
–	B30-0123-05	Pilot lamp(8V 300mA white) x 3	☆
–	B31-0235-05	S meter	
–	B31-0236-05	T meter	
–	B31-0247-05	D/M meter	☆
–	B42-0009-04	Passed sticker	
–	D15-0155-03	Dial pulley (A)	
–	D15-0156-03	Dial pulley (B)	
–	D15-0160-04	Small pulley	
–	D19-0050-14	Back plate	
–	D20-0124-03	Dial shaft ass'y	☆
–	E04-0001-05	F-type connector	
–	E05-0125-05	F-type plug	
–	E13-0212-05	Pin jack (2P) x 3	
–	E29-0082-05	Antenna terminal	
–	E30-0505-05	Audio cord	
–	F99-0011-04	Slider	
–	G01-0312-04	Spring x 2	
–	G01-0314-04	Dial spring	
–	G11-0051-14	Cushion x 2	
–	H10-1348-12	Polystyrene foamed fixture	
–	H10-1349-12	Polystyrene foamed fixture	
–	H25-0048-03	Polyethylene bag (110 x 250mm)	
–	H25-0078-00	Instruction bag	
–	H25-0096-04	Polyethylene bag	
–	J13-0034-05	Fuse holder x 2	
–	J19-0306-05	Lead holder x 2	
–	J21-0480-13	Antenna mounting hardware	
–	J32-0227-04	Boss	☆
–	J42-0065-04	Lamp bushing x 3	
–	J61-0024-05	Wire clip (small) x 2	
–	J61-0045-05	Combex x 5	
–	K21-0300-04	Knob (TUNING)	
–	K23-0215-04	Knob (MODE)	
–	K23-0238-04	Knob (LEVEL, MUTING)	
–	K27-0039-04	Knob (POWER)	
–	K29-0247-04	Knob (Pushbutton) x 2	
–	L19-0009-05	Balun transformer	
–	N08-0125-05	Dress screw (8 mm) x 8	
–	N09-0100-14	Screw (small pulley) x 5	

Ref. No.	Parts No.	Description	Re-marks
–	T90-0002-05	FM indoor antenna	
–	T90-0031-05	AM bar antenna	
–	X01-1220-00	FM front-end	☆
–	X03-1020-10	AM tuner unit	☆
–	X05-1350-10	FM tuner unit	☆

POWER SUPPLY (X00-1760-11, -61)

Ref. No.	Parts No	Description	Re-marks
		CAPACITOR	
Ck1~4	CK45E2H103P	Ceramic 0.01μF 500WV	
Ck5	C90-0325-05	Electrolytic 2200μF 25WV	
Ck6	CE04W1E471EL	Electrolytic 470μF 25WV	
Ck7	CE04W1E221EL	Electrolytic 220μF 25WV	
Ck8	CE04W1E101EL	Electrolytic 100μF 25WV	
Ck9,10	CQ93M1H223M	Mylar 0.022μF ±20%	
Ck11	CE04W1C471EL	Electrolytic 470μF 16WV	
Ck12	CE04W1C221EL	Electrolytic 220μF 16WV	
Ck13	CS15E1E3R3M	Tantalum 3.3μF 25WV	
Ck14	CS15E1E6R8M	Tantalum 6.8μF 25WV	
Ck15	C91-0001-05	Ceramic 0.01μF 125WV	-11
	CK45E3D103PMU	Ceramic 0.01μF 2kWV	-61
		RESISTOR	
Rk1	PD14BY2E183J	Carbon 180Ω ±5% 1/4W	
Rk2	PD14BY2E471J	Carbon 470Ω ±5% 1/4W	
Rk3	PD14BY2E181J	Carbon 180Ω ±5% 1/4W	
Rk4	PD14BY2E331J	Carbon 330Ω ±5% 1/4W	
Rk5	RN14AB3D4R7JB	Metal film 4.7Ω ±5% 2W	
Rk6	PD14BY2E824J	Carbon 820kΩ ±5% 1/4W	
Rk7	PD14BY2E182J	Carbon 1.8kΩ ±5% 1/4W	
Rk8	RC05GF2H225K	Carbon 2.2MΩ ±10% 1/2W	-11
		SEMICONDUCTOR	
Qk1	V03-0343-05	Transistor 2SC1419 (C)	
Qk2	V01-0116-05	Transistor 2SA755 (C)	
Qk3	V03-0270-05	Transistor 2SC945 (Q) or (R)	
Dk1	V11-0252-05	Diode SIRB10 (100V, 1A)	
Dk2, 3	V11-0295-05	Dioda W06B (100V, 0.75A)	
Dk4	V11-0273-05	Diode 1S2076 (30V, 150mA)	
DZk1,2	V11-0254-05	Zener diode YZ-140(14V,500mW)	
		MISCELLANEOUS	
Fk1,2	F05-8018-05	Fuse 800mA (UL) x 2	-11
	F05-8012-05	Fuse 800mA (S) x 2	-61
	F05-8015-05	Fuse 800mA (J) x 2	-00
Fk3	F05-3021-06	Fuse 3A (UL)	-11
	F05-3122-05	Fuse 3.15A (S)	-61
	F05-3022-05	Fuse 3A (J)	-00
–	J13-0020-05	Fuse holder (φ6 x 30) x 6	-00 -11
–	J13-0039-05	Fuse holder (φ5 x 20) x 6	-61

FM FRONT-END (X01-1220-10)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Ca1	CC45CH1H080D	Ceramic 8pF ±0.5pF	
Ca2	CC45SL1H330J	Ceramic 33pF ±5%	
Ca3,4	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Ca5	CC45SL1H150J	Ceramic 15pF ±5%	
Ca6	CC45CH1H120J	Ceramic 12pF ±5%	
Ca7	CC45CH1H100J	Ceramic 10pF ±5%	
Ca8	CC45SL1H080D	Ceramic 8pF ±0.5pF	
Ca9,10	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Ca11	CC45SL1H150J	Ceramic 15pF ±5%	
Ca12	CC45CH1H120J	Ceramic 12pF ±5%	

PARTS LIST

Ref. No.	Parts No.	Description	Remarks
Ca13	C91-0020-05	Ceramic 0.68pF ±20%	
Ca14	CC45SL1H150J	Ceramic 15pF ±5%	
Ca15	CC45CH1H120J	Ceramic 12pF ±5%	
Ca16	CC45SL1H221K	Ceramic 220pF ±10%	
Ca17	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Ca18	CC45CH1H220J	Ceramic 22pF ±5%	
Ca19	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Ca20	CQ93M1H103K	Mylar 0.01μF ±10%	
Ca21	CC45CH1H060D	Ceramic 6pF ± 0.5pF	
Ca22	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
	RESISTOR		
Ra1	PD14CY2E154J	Carbon 150kΩ ±5% 1/4W	
Ra2	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
Ra3	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
Ra4	PD14CY2E824J	Carbon 820kΩ ±5% 1/4W	
Ra5	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
Ra6	PD14CY2E682J	Carbon 6.8kΩ ±5% 1/4W	
Ra7	PD14CY2E154J	Carbon 150kΩ ±5% 1/4W	
Ra8	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
Ra9	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
Ra10	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
Ra11,12	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
Ra13	PD14CY2E820J	Carbon 82Ω ±5% 1/4W	
Ra14	PD14CY2E682J	Carbon 6.8kΩ ±5% 1/4W	
Ra15	PD14CY2E562J	Carbon 5.6kΩ ±5% 1/4W	
Ra16	PD14CY2E682J	Carbon 6.8kΩ ±5% 1/4W	
Ra17	PD14CY2E391J	Carbon 390Ω ±5% 1/4W	
Ra18	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
Ra19	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
	SEMICONDUCTOR		
Qa1,2	V09-0108-05	FET SD306	
Qa3	V09-0103-05	FET 3SK49 (R)	
	TRIMMER / COIL		
TCa1~5	C05-0010-15	Ceramic trimmer	
TCa6,7	C05-0013-15	Ceramic trimmer	
Ta1	L31-0377-05	FM ANT coil	
Ta2	L31-0382-05	FM RF coil	
Ta3	L31-0379-05	FM RF coil	
Ta4,5	L31-0382-05	FM RF coil	
Ta6	L30-0246-05	FM IFT	
La1,2	L33-0025-05	Choke coil	
La3	L40-1091-41	Ferri-inductor	
	MISCELLANEOUS		
—	C01-0195-05	Variable capacitor	☆
—	E29-0086-04	Lead plate	☆

AM TUNER (X03-1020-10)

Ref. No.	Parts No.	Description	Remarks
	CAPACITOR		
Cf1	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cf3	CE04W1C101	Electrolytic 100μF 16WV	
Cf4	CE04W1E4R7	Electrolytic 4.7μF 25WV	
Cf5	CE04W1C100	Electrolytic 10μF 16WV	
Cf6	CE04W1H010	Electrolytic 1μF 50WV	
Cf7	CC45SL1H150K	Ceramic 15pF ±10%	
Cf8	CQ93M1H102K	Mylar 0.001μF ±10%	
Cf9	CC45SL1H150K	Ceramic 15pF ±10%	
Cf10	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cf11	CQ09S1H361J	Polystyrene 360pF ±5%	
Cf12~14	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cf15	CQ93M1H683K	Mylar 0.068μF ±10%	
Cf16	CE04W1H010	Electrolytic 1μF 50WV	
Cf17	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cf18	CC45SL1H470K	Ceramic 47pF ±10%	
	RESISTOR		
Rf2	PD14BY2B272J	Carbon 2.7kΩ ±5% 1/8W	
Rf3	PD14BY2B122J	Carbon 1.2kΩ ±5% 1/8W	
Rf4	PD14BY2B101J	Carbon 100Ω ±5% 1/8W	
Rf5	PD14BY2B682J	Carbon 6.8kΩ ±5% 1/8W	
Rf6,7	PD14BY2B103J	Carbon 10kΩ ±5% 1/8W	
Rf8	PD14BY2B222J	Carbon 2.2kΩ ±5% 1/8W	
Rf9	PD14BY2B104J	Carbon 100kΩ ±5% 1/8W	
Rf10	PD14BY2B222J	Carbon 2.2kΩ ±5% 1/8W	
Rf11	PD14BY2B562J	Carbon 5.6kΩ ±5% 1/8W	
Rf12	PD14BY2B104J	Carbon 100kΩ ±5% 1/8W	
Rf13	PD14BY2B391J	Carbon 390Ω ±5% 1/8W	
Rf14	PD14BY2B183J	Carbon 18kΩ ±5% 1/8W	
	SEMICONDUCTOR		
ICf1	V30-0134-05	IC HA1151	
Qf2	V03-0270-05	Transistor 2SC945 (Q)	
Df1	V11-0076-05	Diode 1S1555	
	COIL / INDUCTOR / FILTER		
Lf1	L40-1021-43	Inductor 1 mH	
Lf2	L30-0284-05	IFT	
Lf3	L32-0181-05	OSC coil	
Lf4	L72-0036-05	Ceramic filter	

FM TUNER (X05-1350-10)

Ref. No.	Parts No.	Description	Remarks
	CAPACITOR		
Cg1~33	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cg34	CQ93M1H562J	Mylar 5600pF ±5%	
Cg35,36	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cg37	CK45D1H561M	Ceramic 560pF ±20%	
Cg38	CE04W1H010	Electrolytic 1μF 50WV	
Cg39	CE04W1H3R3	Electrolytic 3.3μF 50WV	
Cg40	CE04W1H010	Electrolytic 1μF 50WV	
Cg41~45	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cg46	CE04W1H010MBR	Electrolytic 1μF 50WV	
Cg47	CE04W1H3R3MBR	Electrolytic 3.3μF 50WV	
Cg48	CE04W1H010MBR	Electrolytic 1μF 50WV	
Cg49,50	CK45F1H103Z	Ceramic 0.01μF +80%, -20%	
Cg51	CE04W1C221	Electrolytic 220μF 16WV	
Cg52	CE04W1C101	Electrolytic 100μF 16WV	
Cg53	CE04W1C100MBR	Electrolytic 10μF 16WV	
Cg54,55	CE04W1H010MBR	Electrolytic 1μF 50WV	
Cg58	CE04W1H3R3	Electrolytic 3.3μF 50WV	
Cg59	CE04W1E100	Electrolytic 10μF 25WV	
Cg60	CE04W1H3R3MBR	Electrolytic 3.3μF 50WV	
Cg61	CE04W1C470MBR	Electrolytic 47μF 16WV	
Cg62	CQ93M1H103K	Mylar 0.01μF ±10%	
Cg63	CC45SL1H101K	Ceramic 100pF ±10%	
Cg64	CQ93M1H103K	Mylar 0.01μF ±10%	
Cg65	CE04W1H010	Electrolytic 1μF 50WV	
Cg66	CQ93M1H334M	Mylar 0.33μF ±20%	
Cg67	CE04W1C100MBR	Electrolytic 10μF 16WV	
Cg68	CE04W1C470MBR	Electrolytic 47μF 16WV	
Cg69	CQ09S1H361J	Polystyrene 360pF ±5%	
Cg70	CE04W1C470	Electrolytic 47μF 16WV	
Cg71,72	CE04W1H010MBR	Electrolytic 1μF 50WV	
Cg73~76	CC45SL1H270K	Ceramic 27pF ±10%	
Cg77,78	CE04W1C101	Electrolytic 100μF 16WV	
Cg79,80	CE04W1H010MBR	Electrolytic 1μF 50WV	
Cg81,82	CC45SL1H330K	Ceramic 33pF ±10%	
Cg83,84	CQ09S1H102GB	Polystyrene 1000pF ±2%	
Cg85~88	CQ93M1H154K	Mylar 0.15μF ±10%	
Cg89,90	CE04W1A470EL	Electrolytic 47μF 10WV	

PARTS LIST

Ref. No.	Parts No.	Description			Remarks
Cg91	CQ93M1H223K	Mylar	0.022μF	±10%	
Cg92	CE04W1H010	Electrolytic	1μF	50WV	
Cg93	CK45D1H391M	Ceramic	390pF	±20%	
Cg94	CE04W1H010	Electrolytic	1μF	50WV	
Cg95	CQ93M1H473M	Mylar	0.047μF	50WV	
Cg96	CE04W1E100	Electrolytic	10μF	25WV	
Cg97	CE04W1A101	Electrolytic	100μF	10WV	
Cg98	CC45SL1H270K	Ceramic	27pF	±10%	
Cg101~103	CK45F1H103Z	Ceramic	0.01μF	+80%, -20%	
Cg104	CC45SL1H030C	Ceramic	3pF	±0.25pF	
Cg105	CK45F1H473Z	Ceramic	0.047μF	+80%, -20%	
Cg106	CK45F1H103Z	Ceramic	0.01μF	+80%, -20%	
Cg107	CC45SL1H050C	Ceramic	5pF	±0.25pF	
Cg108,109	CK45F1H103Z	Ceramic	0.01μF	+80%, -20%	
Cg110	CC45SL1H050C	Ceramic	5pF	±0.25pF	
Cg111	CK45F1H103Z	Ceramic	0.01μF	+80%, -20%	
Cg112	CE04W1C101	Electrolytic	100μF	16WV	
Cg114	CK45F1H103Z	Ceramic	0.01μF	+80%, -20%	
Cg115	CS15E1VR22M	Tantalum	0.22μF	35WV	
Cg116,117	CE04W1C100MBR	Electrolytic	10μF	16WV	

RESISTOR

Rg1	PD14BY2B471JKW	Carbon	470Ω	±5%	1/8W
Rg2	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg3	PD14BY2B561JKW	Carbon	560Ω	±5%	1/8W
Rg4	PD14BY2B102JKW	Carbon	1kΩ	±5%	1/8W
Rg5	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg6	PD14BY2B561JKW	Carbon	560Ω	±5%	1/8W
Rg7	PD14BY2B122JKW	Carbon	1.2kΩ	±5%	1/8W
Rg8	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg9,10	PD14BY2B331JKW	Carbon	330Ω	±5%	1/8W
Rg11	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg12,13	PD14BY2B331JKW	Carbon	330Ω	±5%	1/8W
Rg14	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg15	PD14BY2B331JKW	Carbon	330Ω	±5%	1/8W
Rg16	PD14BY2B561JKW	Carbon	560Ω	±5%	1/8W
Rg17	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg21	PD14BY2B102JKW	Carbon	1kΩ	±5%	1/8W
Rg22	PD14BY2B122JKW	Carbon	1.2kΩ	±5%	1/8W
Rg23	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg24	PD14BY2B122JKW	Carbon	1.2kΩ	±5%	1/8W
Rg25	PD14BY2B561JKW	Carbon	560Ω	±5%	1/8W
Rg26	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg27	PD14BY2B102JKW	Carbon	1kΩ	±5%	1/8W
Rg28	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg29	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W
Rg30	PD14BY2B222JKW	Carbon	2.2kΩ	±5%	1/8W
Rg31	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg32	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W
Rg33	PD14BY2B123JKW	Carbon	12kΩ	±5%	1/8W
Rg34	PD14BY2B102JKW	Carbon	1kΩ	±5%	1/8W
Rg35	PD14BY2B332JKW	Carbon	3.3kΩ	±5%	1/8W
Rg36	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg37	PD14BY2B822JKW	Carbon	8.2kΩ	±5%	1/8W
Rg38	PD14BY2B563JKW	Carbon	56kΩ	±5%	1/8W
Rg39	PD14BY2B331JKW	Carbon	330Ω	±5%	1/8W
Rg40	PD14BY2B222JKW	Carbon	2.2kΩ	±5%	1/8W
Rg41	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg42	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W
Rg43	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W
Rg44	PD14BY2B563JKW	Carbon	56kΩ	±5%	1/8W
Rg45	PD14BY2B104JKW	Carbon	100kΩ	±5%	1/8W
Rg46	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W
Rg47	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W
Rg48	PD14BY28224JKW	Carbon	220kΩ	±5%	1/8W
Rg49	PD14BY2E824JKW	Carbon	820kΩ	±5%	1/8W
Rg50	R92-0161-05	Carbon	3.9kΩ	±5%	1/8W
Rg51	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W
Rg52	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W
Rg53	PD14BY2B123JKW	Carbon	12kΩ	±5%	1/8W
Rg54	PD14BY2B823JKW	Carbon	82kΩ	±5%	1/8W

Ref. No.	Parts No.	Description				Remarks
Rg55	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg56	PD14BY2B224JKW	Carbon	220kΩ	±5%	1/8W	
Rg57	R92-0161-05	Carbon	3.9kΩ	±5%	1/8W	
Rg58,59	RN14AB2E562JMA	Metal film	5.6kΩ	±5%	1/4W	
Rg60	PD14BY2B471JKW	Carbon	470Ω	±5%	1/8W	
Rg61	PD14BY2B471JKW	Carbon	470Ω	±5%	1/8W	
Rg62	PD14BY2B472JKW	Carbon	4.7kΩ	±5%	1/8W	
Rg63,64	PD14BY2B473JKW	Carbon	47kΩ	±5%	1/8W	
Rg65	PD14BY2B273JKW	Carbon	27kΩ	±5%	1/8W	
Rg66	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg67	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg68,69	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg71,72	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg73	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W	
Rg74	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W	
Rg75,76	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg77,78	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg79	RN14AB2E562JMA	Metal film	5.6kΩ	±5%	1/4W	
Rg80	PD14BY2B271JKW	Carbon	270Ω	±5%	1/8W	
Rg81	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg82,83	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W	
Rg84	PD14BY2B272JKW	Carbon	2.7kΩ	±5%	1/8W	
Rg85	PD14BY2B184JKW	Carbon	180kΩ	±5%	1/8W	
Rg86	PD14BY2B273JKW	Carbon	27kΩ	±5%	1/8W	
Rg87	PD14BY2B272JKW	Carbon	2.7kΩ	±5%	1/8W	
Rg88	PD14BY2B561JKW	Carbon	560Ω	±5%	1/8W	
Rg89	PD14BY2B271JKW	Carbon	270Ω	±5%	1/8W	
Rg90,91	PD14BY2B333JKW	Carbon	33kΩ	±5%	1/8W	
Rg92	PD14BY2E824JKW	Carbon	820kΩ	±5%	1/8W	
Rg93	PD14BY2E274JKW	Carbon	270kΩ	±5%	1/8W	
Rg94,95	PD14BY2B153JKW	Carbon	15kΩ	±5%	1/8W	
Rg96	PD14BY2B181JKW	Carbon	180Ω	±5%	1/8W	
Rg97	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg98	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W	
Rg99	PD14BY2B222JKW	Carbon	2.2kΩ	±5%	1/8W	
Rg100,101	PD14BY2B822JKW	Carbon	8.2kΩ	±5%	1/8W	
Rg102,103	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg104~107	PD14BY2B154JKW	Carbon	150kΩ	±5%	1/8W	
Rg108	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W	
Rg109	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg110	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W	
Rg111	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg112	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W	
Rg113	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg114	PD14BY2B562JKW	Carbon	5.6kΩ	±5%	1/8W	
Rg115	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg116	PD14BY2B102JKW	Carbon	1kΩ	±5%	1/8W	
Rg117,118	PD14BY2B104JKW	Carbon	100kΩ	±5%	1/8W	
Rg119,120	PD14BY2B332JKW	Carbon	3.3kΩ	±5%	1/8W	
Rg121,122	PD14BY2B222JKW	Carbon	2.2kΩ	±5%	1/8W	
Rg123,124	PD14BY2E332JKW	Carbon	3.3kΩ	±5%	1/4W	
Rg125,126	RN14BK2E303KFMA	Metal film	30kΩ	±1%	1/4W	
Rg127,128	PD14BY2E563JKW	Carbon	56kΩ	±5%	1/4W	
Rg129,130	PD14BY2E272JKW	Carbon	2.7kΩ	±5%	1/4W	
Rg131~134	PD14BY2E124JKW	Carbon	120kΩ	±5%	1/4W	
Rg135,136	PD14BY2E102JKW	Carbon	1kΩ	±5%	1/4W	
Rg137,138	PD14BY2E104JKW	Carbon	100kΩ	±5%	1/4W	
Rg139~142	PD14BY2E222JKW	Carbon	2.2kΩ	±5%	1/4W	
Rg144,145	PD14BY2B104JKW	Carbon	100kΩ	±5%	1/8W	
Rg146	PD14BY2B392JKW	Carbon	3.9kΩ	±5%	1/8W	
Rg147	PD14BY2B104JKW	Carbon	100kΩ	±5%	1/8W	
Rg148,149	PD14BY2B563JKW	Carbon	56kΩ	±5%	1/8W	
Rg150~153	PD14BY2E824JKW	Carbon	820kΩ	±5%	1/4W	
Rg154	PD14BY2B332JKW	Carbon	3.3kΩ	±5%	1/8W	
Rg155	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg156	PD14BY2B473JKW	Carbon	47kΩ	±5%	1/8W	
Rg157	PD14BY2B682JKW	Carbon	6.8kΩ	±5%	1/8W	
Rg158,159	PD14BY2B102JKW	Carbon	1kΩ	±5%	1/8W	
Rg160,161	PD14BY2B223JKW	Carbon	22kΩ	±5%	1/8W	
Rg162	PD14BY2B103JKW	Carbon	10kΩ	±5%	1/8W	
Rg165	PD14BY2B101JKW	Carbon	100Ω	±5%	1/8W	

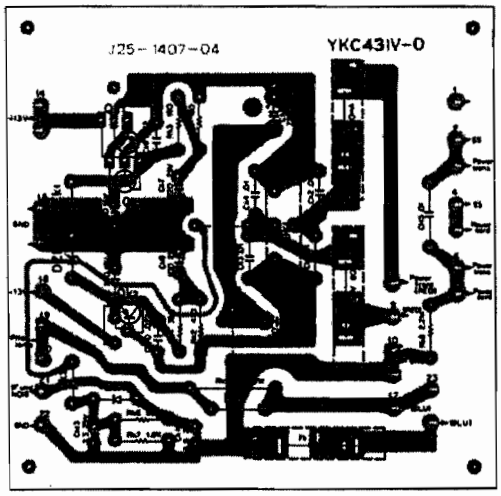
PARTS LIST

Ref. No.	Parts No.	Description	Remarks
Rg166	PD14BY2B682JKW	Carbon 6.8kΩ ±5% 1/8W	
Rg167,168	PD14BY2B102JKW	Carbon 1kΩ ±5% 1/8W	
Rg169,170	PD14BY2B562JKW	Carbon 5.6kΩ ±5% 1/8W	
Rg171	PD14BY2B103JKW	Carbon 10kΩ ±5% 1/8W	
Rg173	PD14BY2B561JKW	Carbon 560Ω ±5% 1/8W	
Rg174	PD14BY2B223JKW	Carbon 22kΩ ±5% 1/8W	
Rg175	PD14BY2B102JKW	Carbon 1kΩ ±5% 1/8W	
Rg176,177	PD14BY2B122JKW	Carbon 1.2kΩ ±5% 1/8W	
Rg178	PD14BY2B101JKW	Carbon 100Ω ±5% 1/8W	
Rg179	PD14BY2B102JKW	Carbon 1kΩ ±5% 1/8W	
Rg180,181	PD14BY2B122JKW	Carbon 1.2kΩ ±5% 1/8W	
Rg182	PD14BY2B101JKW	Carbon 100Ω ±5% 1/8W	
Rg183	PD14BY2B102JKW	Carbon 1kΩ ±5% 1/8W	
Rg184	PD14BY2B104JKW	Carbon 100kΩ ±5% 1/8W	
Rg185	PD14BY2B561JKW	Carbon 560Ω ±5% 1/8W	
Rg186	PD14BY2B223JKW	Carbon 22kΩ ±5% 1/8W	
Rg187	PD14BY2B561JKW	Carbon 560Ω ±5% 1/8W	
Rg188	PD14BY2B331JKW	Carbon 330Ω ±5% 1/8W	
Rg189	PD14BY2B393JKW	Carbon 39kΩ ±5% 1/8W	
Rg190	PD14BY2B154JKW	Carbon 150kΩ ±5% 1/8W	
Rg191	PD14BY2B223JKW	Carbon 22kΩ ±5% 1/8W	
Rg192	PD14BY2B101JKW	Carbon 100Ω ±5% 1/8W	
Rg193	PD14BY2B563JKW	Carbon 56kΩ ±5% 1/8W	
Rg194	PD14BY2B153JKW	Carbon 15kΩ ±5% 1/8W	
Rg195	PD14BY2B102JKW	Carbon 1kΩ ±5% 1/8W	
Rg196,197	PD14BY2B104JKW	Carbon 100kΩ ±5% 1/8W	
SEMICONDUCTOR			
Qg1,2	V09-0071-05	FET 2SK55 (D)	
Qg5~7	V03-0098-05	Transistor 2SC535 (B)	
Qg8,9	V01-0084-05	Transistor 2SA733 (P) or (Q)	
Qg10~14	V03-0405-05	Transistor 2SC945 (P) or (Q)	
Qg15~17	V03-0309-05	Transistor 2SC1345 (D)or (E)	
Qg18,19	V03-0405-05	Transistor 2SC945 (P) or (Q)	
Qg20,21	V09-0092-05	FET 2SK68 (L) or (M)	
Qg22	V03-0271-05	Transistor 2SC1345 (E)	
Qg23	V09-0092-05	FET 2SK68 (L) or (M)	
Qg24	V03-0271-05	Transistor 2SC1345 (E)	
Qg25	V09-0092-05	FET 2SK68 (L) or (M)	
Qg26	V03-0271-05	Transistor 2SC1345 (E)	
Qg27	V09-0092-05	FET 2SK68 (L) or (M)	
Qg28	V03-0271-05	Transistor 2SC1345 (E)	
Qg29,30	V03-0309-05	Transistor 2SC1345 (D) or (E)	
Qg31,32	V03-0405-05	Transistor 2SC945 (P) or (Q)	
Qg33	V01-0084-05	Transistor 2SA733 (P) or (Q)	
Qg35,36	V03-0098-05	Transistor 2SC535 (B)	
Qg38	V03-0405-05	Transistor 2SC945 (P) or (Q)	
Qg39	V03-0309-05	Transistor 2SC1345 (D) or (E)	
ICg1~7	V30-0087-05	IC TA7060P	
ICg8	V30-0177-05	IC μPC577H (E) or (F)	
ICg9	V30-0087-05	IC TA7060P	
ICg10	V30-0088-05	IC RC4558T	
ICg11	V30-0091-05	IC RC4558TA	
ICg12	V30-0099-05	IC HA1156W	
ICg13	V30-0091-05	IC RC4558TA	
ICg14	V30-0088-05	IC RC4558T	
Dg1~5	V11-0051-05	Diode 1N60	
Dg6	V11-0076-05	Diode 1S1555 or 1S2076	
Dg7~11	V11-0051-05	Diode 1N60	
Dg12, 13 15~18	V11-0076-05	Diode 1S1555 or 1S2076	
Dg19,20	V11-0051-05	Diode 1N60	
Dg21~23	V11-0076-05	Diode 1S1555 or 1S2076	
POTENTIOMETER			
VRg1	R12-1029-05	PC trimmer 1kΩ	
VRg2,3	R12-5025-05	PC trimmer 100kΩ	
VRg4	R12-0058-05	PC trimmer 470Ω	
VRg5,6	R12-3041-05	PC trimmer 10kΩ	
VRg7	R12-2020-05	PC trimmer 6.8kΩ	
VRg8	R12-3041-05	PC trimmer 10kΩ	

Ref. No.	Parts No.	Description	Remarks
VRg9	R12-1029-05	PC trimmer 1kΩ	
VRg10	R12-3042-05	PC trimmer 47kΩ	
VRg11	R06-2008-05	PC trimmer 5kΩ (B) x 2 OUTPUT LEVEL	☆
VRg12	R12-5025-05	PC trimmer 100kΩ	
SWITCH / RELAY			
S1,3	S42-2013-05	Pushbutton switch IF BAND, METER	☆
S2	S29-1092-05	Slide rotary switch MUTING	☆
S4	S29-1083-05	Slide rotary switch SELECTOR	
RLg2	S51-2033-05	Reed relay	
COIL / INDUCTOR / FILTER			
Lg1	L40-2291-41	Ferri-inductor	
Lg2,3	L40-2201-03	Ferri-inductor	
Lg4 ~6	L30-0247-05	FM IF coil	
Lg7,8	L40-2291-41	Ferri-inductor	
Lg9	L40-2201-03	Ferri-inductor	
Lg11	L30-0274-05	FM IF coil	
Lg12	L40-2201-03	Ferri-inductor	
FLg1,2	L79-0032-05	FM IF LC filter	☆
FLg3~5	L72-0040-05	Ceramic filter	☆
FLg6	L79-0033-05	Low pass filter	
MISCELLANEOUS			
–	E31-0027-05	Connector (CN2)	☆
–	E31-0028-05	Connector (CN1)	☆
–	E31-0029-05	Connector (CN3)	☆
–	J32-0232-04	Hexagonal boss x 4	☆
–	W02-0005-05	FM detector unit	☆

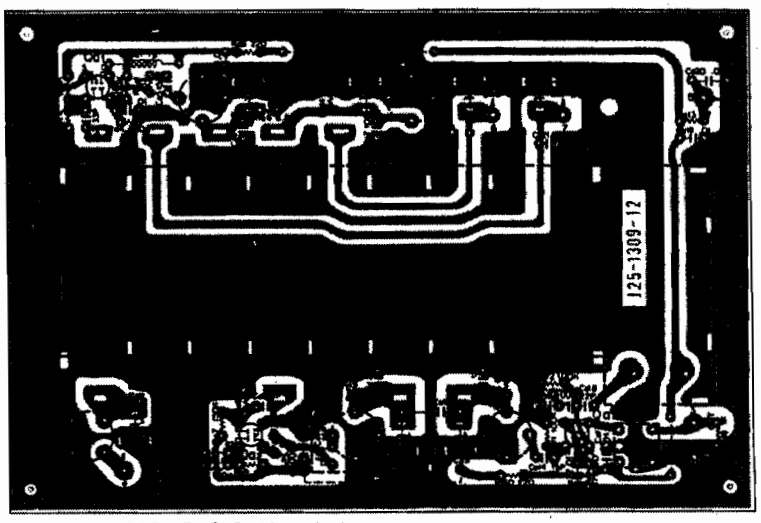
PC BOARD

▶ POWER SUPPLY (X00-1760-11)



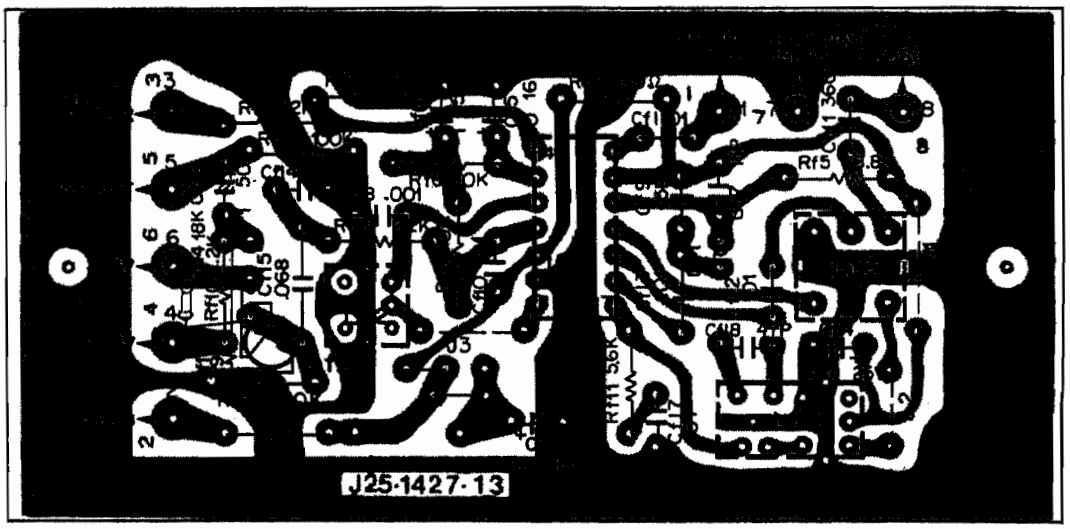
Qk1:2SC1419 (C), Qk2:2SA755 (C), Dk1:S1RB10, Qk3:2SC945 (Q) or (R)
Dk2,3:W0-6B, Dk4:1S2076, DZk1, 2:YZ-140

▶ FM FRONT-END (X01-1220-10)



Qa1, 2:SD306, Qa3:3SK49 (R)

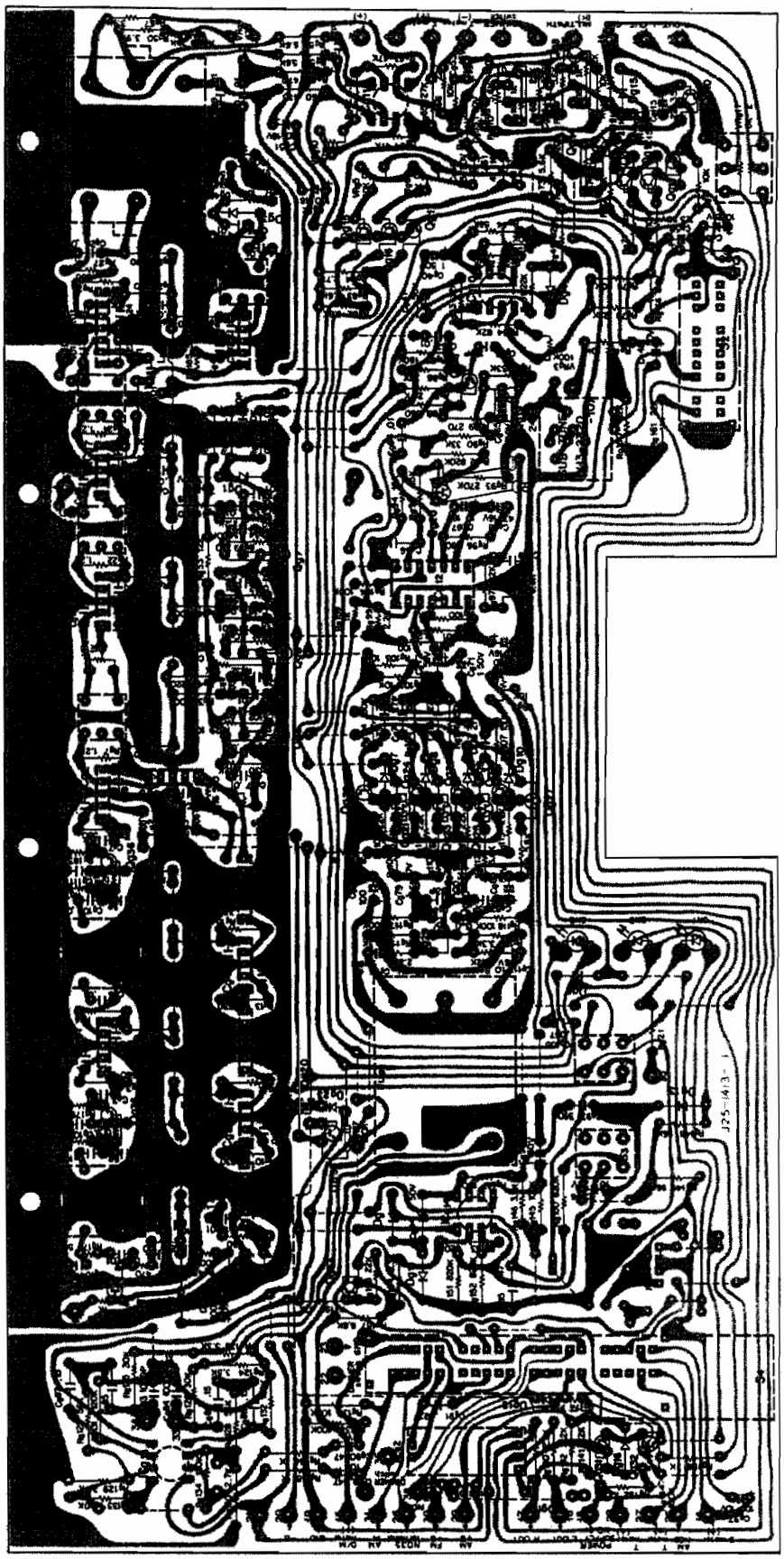
▶ AM TUNER (X03-1020-10)



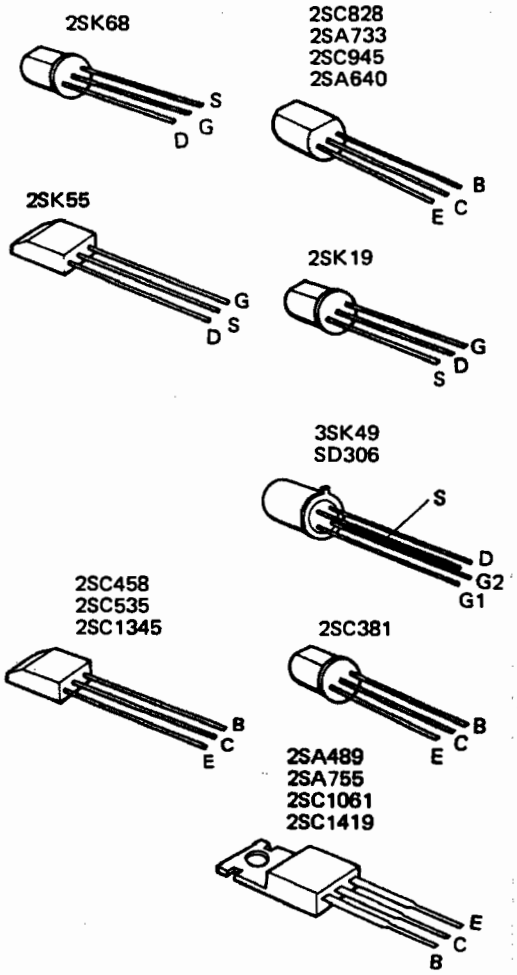
Qf2:2SC945 (Q), ICf1:HA1151, Df1:1S1555

PC BOARD

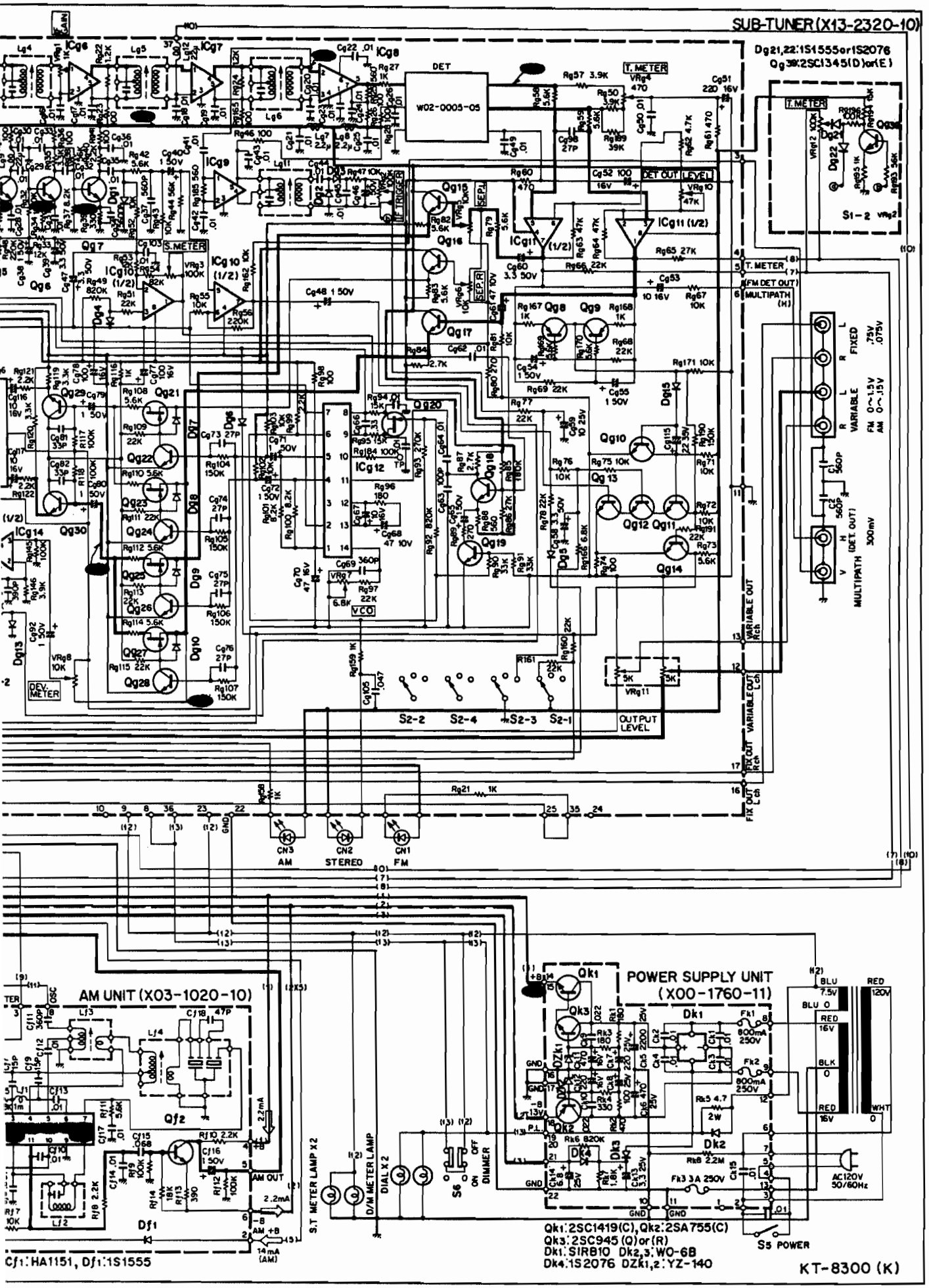
▶ FM TUNER
(X05-1350-10)

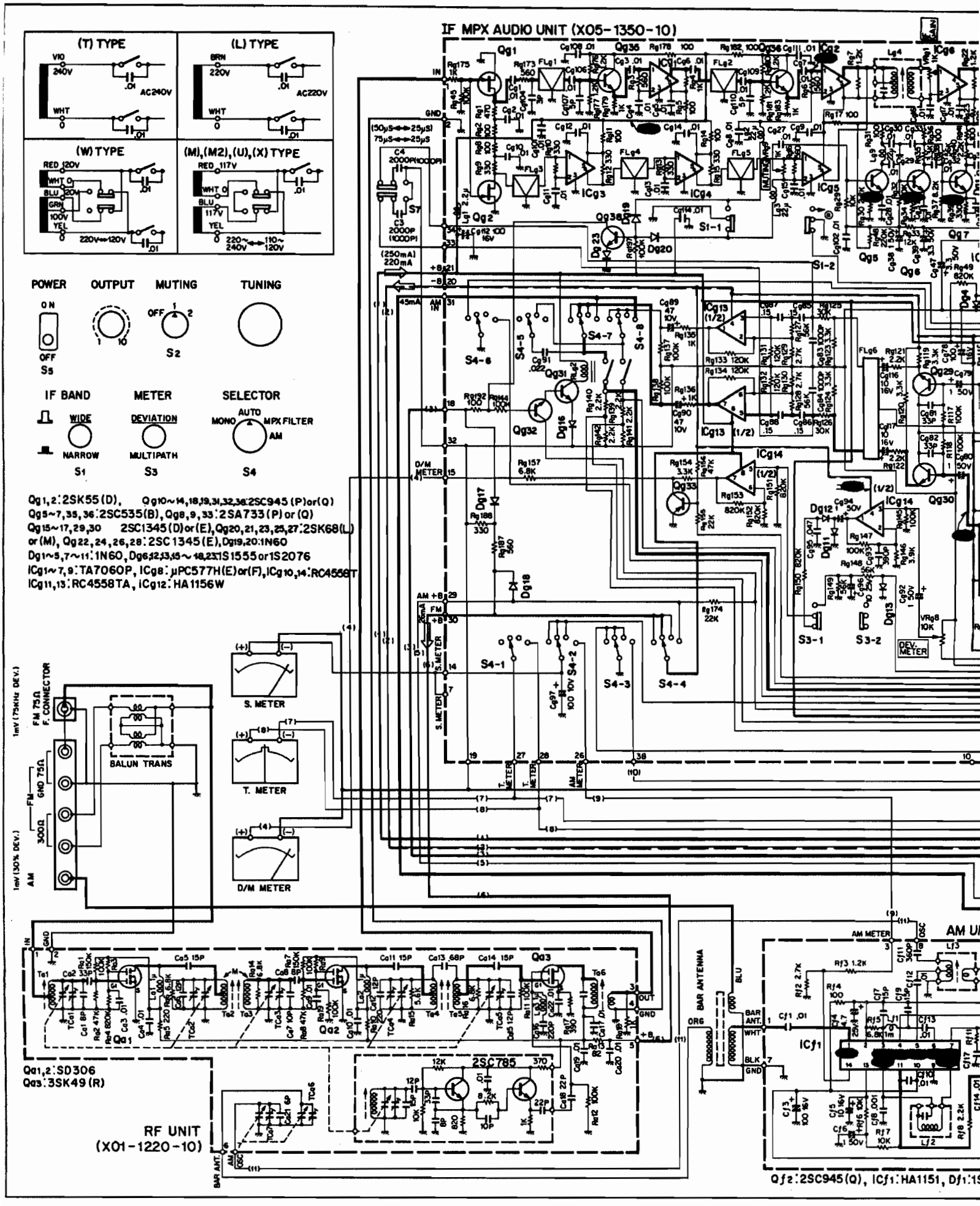


Qg1, 2:2SK55 (D), Qg10~14, 18, 19, 31, 32, 38:2SC945 (P) or (Q), Qg5~7, 35, 36:2SC535 (B), Qg8, 9, 33:2SA733 (P) or (Q), Qg15~17, 29, 30:
2SC1345 (D) or (E), Qg20, 21, 23, 25, 27:2SK68 (L) or (M), Qg22, 24, 26, 28:2SC1345 (E), ICg1~7, 9:TA7060P, ICg8:μPC577H (E) or (F),
ICg10, 14:RC4558T, ICg11, 13:RC4558A, ICg12:HA1156W, Dg1~5, 7~11:1N60, Dg6, 12, 13, 15~18, 23:1S1555 or 1S2076



Semiconductor name	Semiconductor substitutions
POWER SUPPLY (X00-1760-11)	
2SA755	2SA489
2SC945 (Q) or (R)	2SC1345
2SC1419 (C)	2SC1061
RF UNIT (X01-1220-10)	
SD306	–
3SK49 (R)	–
AM UNIT (X03-1020-10)	
2SC945 (Q)	2SC1345
HA1151	–
IF MPX AUDIO UNIT (X05-1350-10)	
2SA733 (P) or (Q)	2SA640
2SC535 (B)	2SC381
2SC945 (P) or (Q)	2SC828 2SC1345
2SC1345 (E)	2SC1000
2SK55	2SK19
2SK68 (L) or (M)	2SK30
HA1156W	–
RC4558TA	–
TA7060P	–
μPC577H (E) or (F)	–


SUB-TUNER (X13-2320-10)
Dg21,22:1S1555 or 1S2076
Qg39:2SC1345(D) or (E)
W02-0005-05
DET
T. METER
S.METER
DET OUT
LEVEL
MULTIPATH (H)
FM DET OUT
VARIABLE
FIXED
MULTIPATH (DET. OUT)
VARIABLE OUT Rch
VARIABLE OUT Lch
FIX OUT Rch
FIX OUT Lch
OUTPUT LEVEL
S2-2 S2-4 S2-3 S2-1
S1-2
DEV. METER
VCO
CN3 AM
CN2 STEREO
CN1 FM
AM UNIT (X03-1020-10)
AM OUT
S.T METER LAMP X2
D/M METER LAMP
DIAL X2
DIMMER
S6
POWER SUPPLY UNIT (X00-1760-11)
BLU
RED
BLK
WHT
AC120V 50/60Hz
S5 POWER
Qk1:2SC1419(C), Qk2:2SA755(C)
Qk3:2SC945(Q) or (R)
Dk1:SIRB10 Dk2,3:WO-68
Dk4:1S2076 DZk1,2:YZ-140
Cf1:HA1151, Df1:1S1555
KT-8300 (K)


IF MPX AUDIO UNIT (X05-1350-10)
(T) TYPE
(L) TYPE
(W) TYPE
(M),(M2),(U),(X) TYPE
POWER
OUTPUT
MUTING
TUNING
IF BAND
METER
SELECTOR
S5
S2
S1
S3
S4
Qg1,2:2SK55(D), Qg10~14,18,19,31,32,36:2SC945(P)or(Q)
Qg5~7,35,36:2SC535(B),Qg8,9,33:2SA733(P)or(Q)
Qg15~17,29,30 2SC1345(D)or(E),Qg20,21,23,25,27:2SK68(L) or(M), Qg22,24,26,28:2SC1345(E),Dg19,20:1N60
Dg1~5,7~11:1N60,Dg6,12,13,15~18,23:1S1555 or 1S2076
ICg1~7,9:TA7060P, ICg8:μPC577H(E)or(F),ICg10,14:RC4556T
ICg11,13:RC4558TA, ICg12:HA1156W
S. METER
T. METER
D/M METER
BALUN TRANS
FM 75Ω F. CONNECTOR
FM GND 75Ω
AM 300Ω
1mV (75KHz DEV.)
1mV (30% DEV.)
Qa1,2:SD306
Qa3:3SK49(R)
RF UNIT
(X01-1220-10)
2SC785
BAR ANTENNA
Qf2:2SC945(Q), ICf1:HA1151, Df1:1S

SPECIFICATIONS/TROUBLESHOOTING

SPECIFICATIONS

FM TUNER SECTION

Usable Sensitivity	1.6 μV
50 dB Quieting Sensitivity	2.8 μV (Mono), 30 μV (Stereo)
Signal to Noise Ratio	78 dB (Mono), 75 dB (Stereo)
Muting Threshold	
Muting 1	7 μV
Muting 2	30 μV

T.H. Distortion

		Mono	Stereo
Wide	1,000Hz	0.08%	0.1%
	50~10,000Hz	0.1%	0.15%
	15,000Hz	0.15%	0.4%
Narrow	1,000Hz	0.15%	0.4%

Frequency Response	20 Hz to 15,000 Hz, +0.2 dB, -1.5 dB
Capture Ratio	1.0 dB (Wide), 1.5 dB (Narrow)
Alternate Channel Selectivity	40 dB (Wide), 110 dB (Narrow)
Spurious Response Ratio	110 dB
Image Response Ratio	110 dB
IF Response Ratio	110 dB
AM Suppression Ratio	60 dB

Stereo Separation

	1,000 Hz	50~10,000 Hz
Wide	50 dB	45 dB
Narrow	45 dB	35 dB

Subcarrier Product Ratio	70 dB
SCA Rejection Ratio	75 dB
Antenna Impedance	300 ohms balanced & 75 ohms unbalanced
FM Frequency Range	88 MHz to 108 MHz 88.5 MHz to 108 MHz (FTZ approved)

AM TUNER SECTION

Usable Sensitivity (IHF)	18 μV
Signal to Noise Ratio	50 dB
Image Rejection	60 dB
Selectivity (IHF)	35 dB

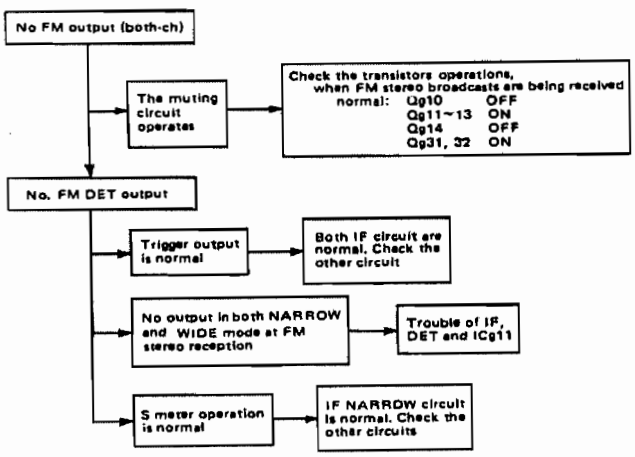
OUTPUT LEVEL

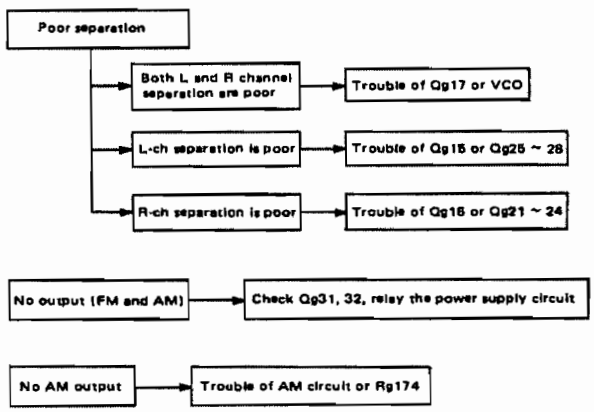
FM (400 Hz, 100% Mod.)	Variable	0~1.5V	1.2 k ohms
	Fixed	0.75V	1.0 k ohms
AM (400 Hz, 30% Mod.)	Variable	0~0.15V	1.2 k ohms
	Fixed	0.075V	1.0 k ohms
Multipath Output	V: 0.1V	H: 0.3V	

GENERAL

Power Requirement	50/60 Hz 110~120V, 220~240V
Power Consumption	22 watts
Dimensions	W 16-15/16" (430mm) H 5-7/8" (149mm) D 14-13/16" (376mm)
Weight	18.7 lbs. (8.5 kg)

TROUBLESHOOTING





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TRIO-KENWOOD ELECTRONICS, N.V.

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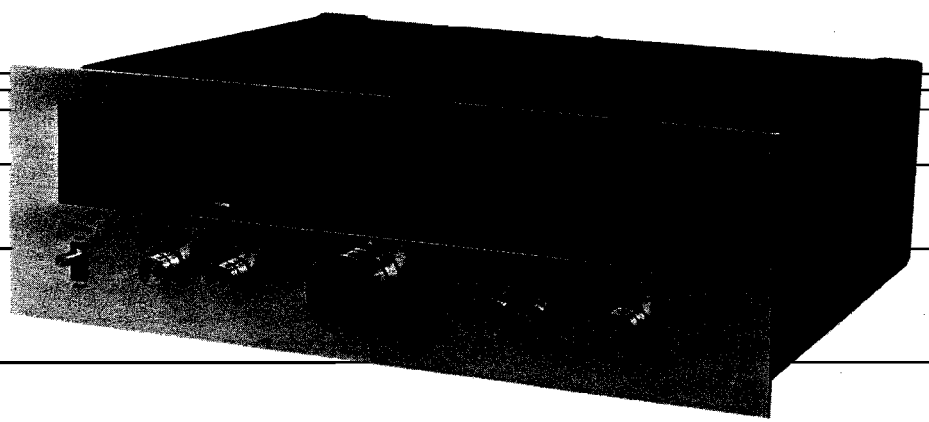
TRIO-KENWOOD CORPORATION

■ 3-6-17 AOBADAI, MEGURO-KU, TOKYO, JAPAN.

AM-FM
STEREO TUNER

KT-8300

INSTRUCTION MANUAL



the sound approach to quality

KENWOOD

INTRODUCTION

The purpose of this manual is to acquaint you with the operating features of your new tuner. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.

We suggest that you read this manual carefully. Knowing how to set up your tuner, to the best advantage, will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your tuner to meet your special requirements.

CONCERNING TRANSISTORS

Transistors differ fundamentally from radio vacuum tubes and require special attention to ensure their full performance capabilities. Given proper care, transistors will provide years of practically trouble-free performance.

PRECAUTIONS ON INSTALLATION

(a) Avoid locations subject to direct sunlight.
(b) Avoid high or low temperature extremes.
(c) Keep the tuner away from heat radiating sources.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

NOTES

1. Units shipped to the U.S.A. and CANADA are designed to be operated with 120 volts AC only. Units shipped to the Scandinavian countries are designed to be operated with 220 volts AC only. Units shipped to the U.K. are designed to be operated with 240 volts AC only. Therefore the above units are not equipped with an AC Voltage Selector Switch so all reference to such a switch throughout this manual should be disregarded.
2. Units shipped to all other countries are equipped with an AC Voltage Selector Switch on the rear panel that is preset at the factory to the voltage generally available in the destination area. It is very important, however, to check the Voltage Selector Switch setting and make sure that it corresponds to your line voltage before connecting the power cord into an AC outlet. If the Voltage Selector Switch requires re-setting, follow the directions outlined on page 5.

SERIAL NUMBER

Record your SERIAL NUMBER on the spaces designated on the warranty card. You will find the serial number on the back of the unit.

AFTER UNPACKING

After unpacking, we recommend you inspect and examine the unit for any possible shipping damage. If your unit is damaged or fails to operate, notify your dealer immediately. If your unit was shipped to you directly, notify the shipping company without delay. Only the consignee (the person or company receiving the unit) can file a claim against the carrier for shipping damage.

We recommend you retain the original carton and packing materials to prevent any damage should you transport or ship your unit in the future.

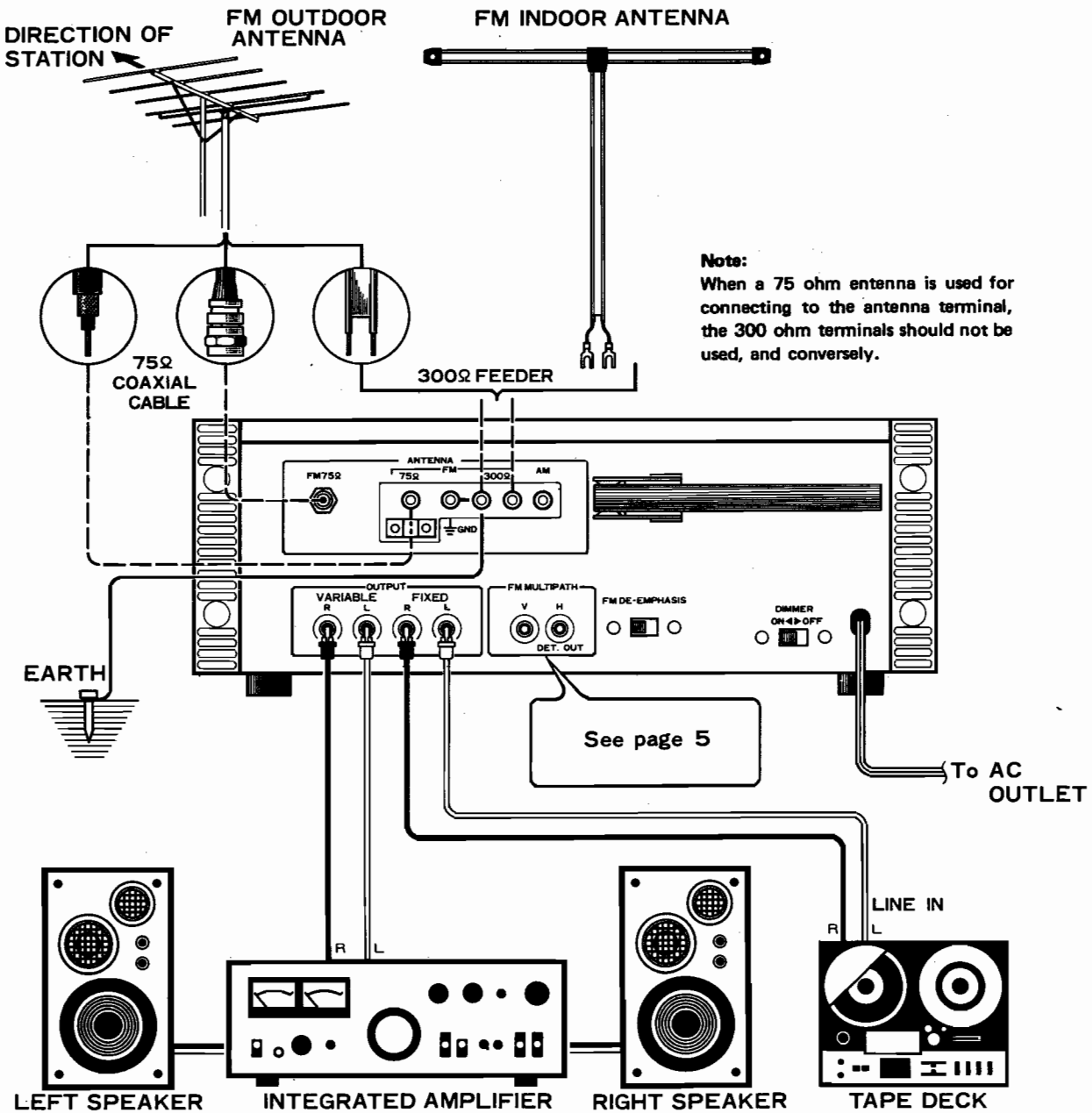
FEATURES

1. Image response characteristic is improved by the adoption of high-accuracy 6-gang variable capacitor.
2. Cross-modulation characteristic is improved by the adoption of "Dual Gate MOS FET".
3. The IF band selector of WIDE/NARROW is installed. In the NARROW setting, high selectivity is assured by use of a 12-element phase linear ceramic filter.
4. The circuits of WIDE of the IF band are provided with LC concentrated filters. Because of their excellent group delay time characteristics, no distortion is generated in the IF stages.
5. Multiplicative Discriminator with Wide Range Linearity to 5 MHz.
6. The PLL of MPX is provided with automatic loop response control to reduce distortion in stereo reception.
7. Separation characteristic is quite favorable due to the effect of new D.S.D.C. MPX by FET switching.
8. Since dual power supply system is adopted for all audio signal lines, dynamic range is very wide.
9. Built-in De-emphasiser to match any * Dolbyized FM broadcasts.

CONTENTS

* Dolby is a Trade Mark of Dolby Laboratories, Inc.

INTERCONNECTING DIAGRAM



CONNECTING INSTRUCTIONS

OUTPUT

VARIABLE

These jacks connect to the stereo amplifier's TUNER or AUX input terminals. The level of these terminals is controlled by the Output Level knob on the front panel.

FIXED

These jacks connect to the tape deck Line Input terminals. The signal level from the output terminals cannot be controlled from the KT-8300; this must be done with the tape deck input level controls.

FM DE-EMPHASIS SWITCH

Selects 75μs (50μs) or 25μs FM DE-EMPHASIS for accurate reception of Dolbyized FM signals. Normally, this switch should be left in the 75μs (50μs) position. However, if the station is broadcasting the Dolbyized signal using a 25μs pre-emphasis, first connect the Dolby Decoder to the KT-8300 and put this switch in the "25μs" position to obtain flat FM frequency response. If in doubt, call the station.

Note: For correct reception of Dolby broadcast, the Dolby Adaptor must be used without fail.

FM MULTIPATH JACKS

This unit is provided with FM multipath jacks through which multipath distortion can be detected in two ways. In one way these jacks are connected with an oscilloscope and the antenna is positioned at the optimum height and in the best direction by observing the displayed wave form until distortion can be lowered to a minimum level. In the other way the antenna is positioned in a direction in which a deflection in the multipath meter on the front panel is reduced to a minimum.

Note: When handling the oscilloscope, please refer to the instruction manual attached to it.

DIMMER SWITCH

The Dial illumination can be dimmed if desired by setting this ON-OFF switch to ON.

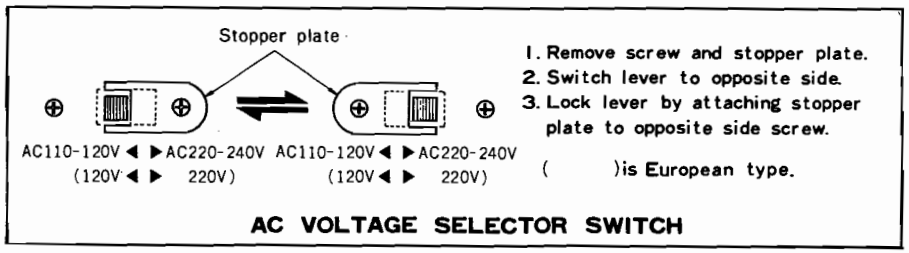
DET. OUT (DETECT OUT)

The FM detector circuit output is made available here so that this tuner will be ready for 4-channel broadcasting developments in the future. When FM discrete 4-channel broadcasting becomes a reality, a simple demodulator connected here will enable you to fully enjoy this coming development.

AC VOLTAGE SELECTION

This unit operates on 110-120 volts or 220-240 volts AC. If the AC Voltage Selector Switch is not set to your line voltage, it must be properly reset. The directions below can be referred to then.

Note: Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC Voltage Selector Switch.



AC VOLTAGE SELECTOR SWITCH

CONNECTING INSTRUCTIONS

FM ANTENNA

Four terminals are provided for connection to a 300- or 75-ohm FM antenna as shown below.

For good FM stereo reception, always use the best antenna possible. In areas close to the transmitting station, a simple T-type antenna may suffice. It should be remembered, however, that the pickup of reflections (similar to "ghosts" on TV) will result in poor stereo reception.

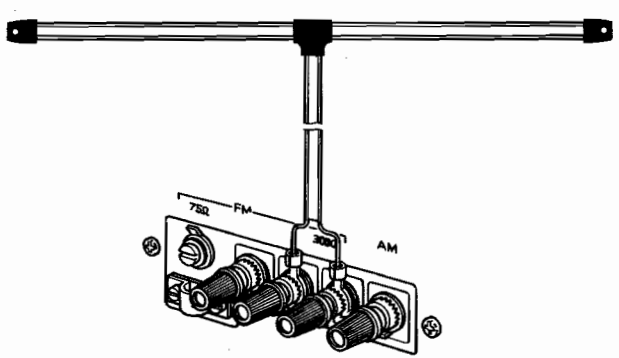
These reflections must, therefore, be reduced to a minimum, either by careful orientation of the T-type indoor antenna or, if this will not eliminate them, by using a more directional outdoor antenna.

In areas at a greater distance from the transmitting stations, the use of an outdoor antenna is highly recommended. It is available in various types. For reception of stations scattered in many directions, a non-directional type antenna will offer better results. When using a directional antenna, always orient it for the best reception of the desired station. The correct position will be indicated by maximum deflection of the SIGNAL meter on your tuner.

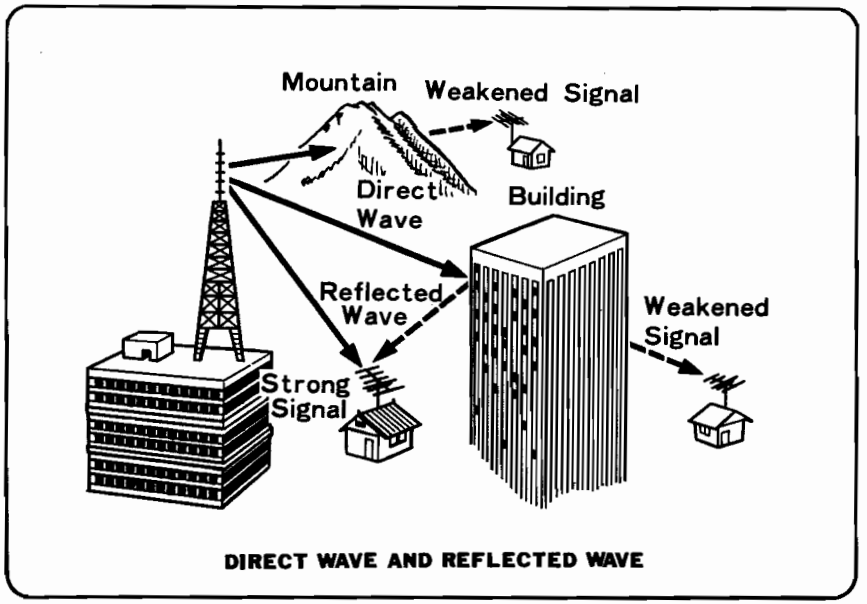
Keep FM antennas away from roads to avoid noises made by the ignition of car, motorcycle, etc.

Note: Consult audio dealer for detailed information on FM antennas and coaxial cable installations.

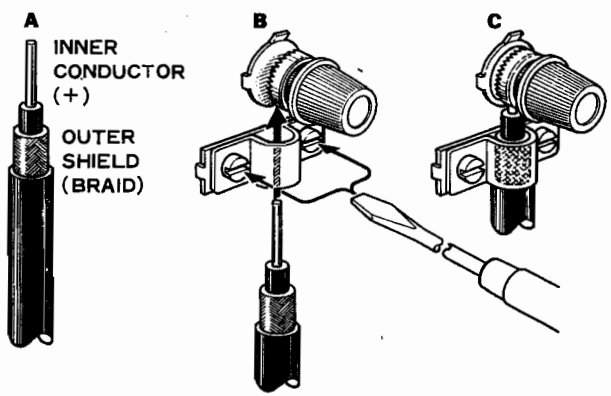
FM T-TYPE ANTENNA



TWIN LEAD(300Ω) CONNECTION



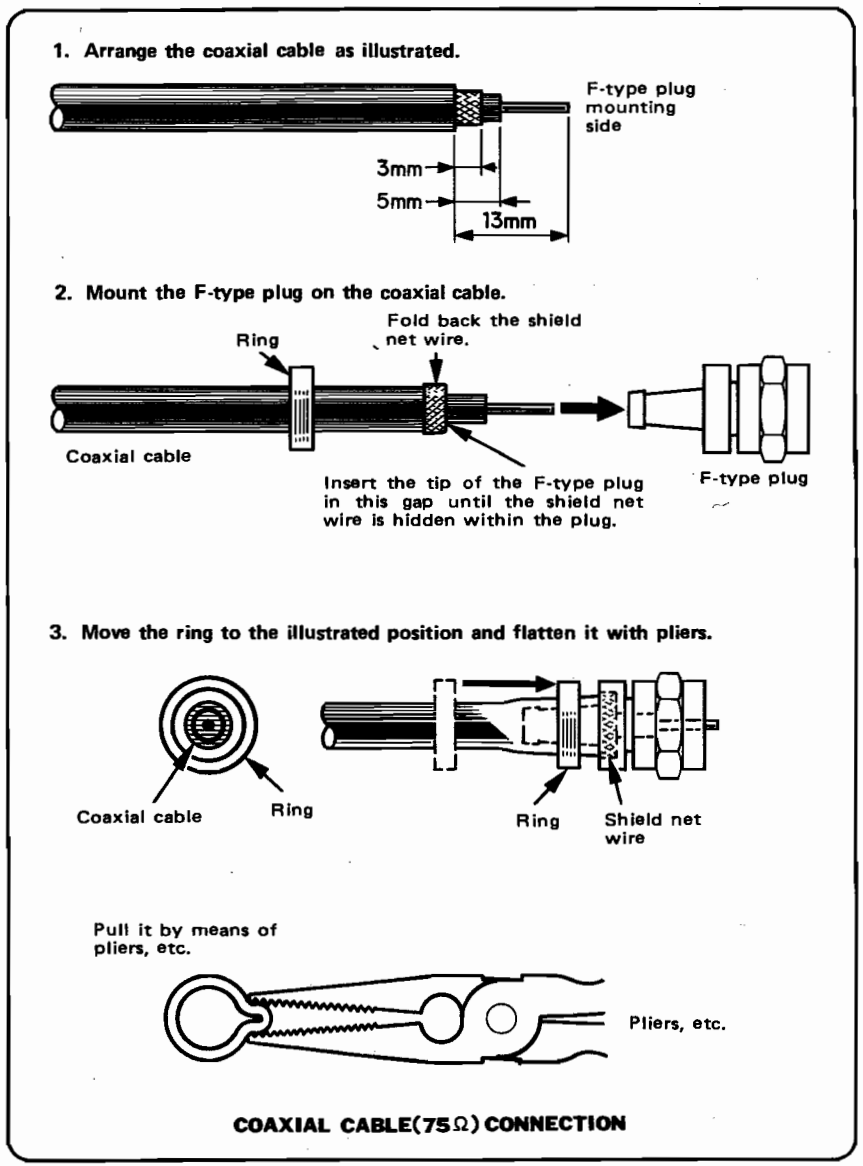
DIRECT WAVE AND REFLECTED WAVE



Strip the coaxial cable as shown in (A).
Loosen the screws and connect the cable as shown in (B).
Then tighten all screws for a connection like (C).

COAXIAL CABLE(75Ω) CONNECTION

CONNECTING INSTRUCTIONS



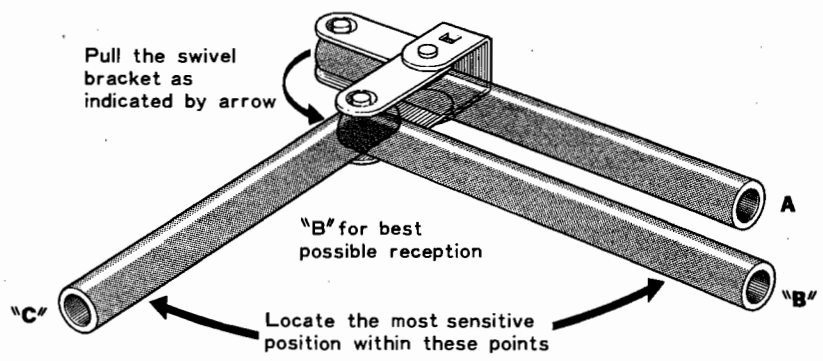
COAXIAL CABLE(75Ω) CONNECTION

AM ANTENNA

The ferrite stick antenna mounted at the rear panel of the tuner will provide satisfactory reception of local stations with strong signals. Because the ferrite stick antenna has directive properties, its direction should be adjusted for best reception while listening to a station. (See Figure below)

AC cords laid adjacent to AM ferrite stick antenna may interfere with reception. Keep them away as far as possible from the ferrite stick antenna.

In fringe areas or in locations surrounded by steel frame buildings where satisfactory reception cannot be obtained with the ferrite stick antenna, an AM outdoor antenna should be connected to the AM terminal.



AM ANTENNA SETTING

CONTROLS AND THEIR FUNCTIONS

① POWER SWITCH

Move up to ON to power the set, down to turn it OFF.
The dial indicator lights when the power is on.

②. OUTPUT LEVEL CONTROL

The signals passing from the OUTPUT (VARIABLE) terminals can be controlled by the OUTPUT LEVEL knob. Use the controls in the following situations:

1) When the KT-8300 is connected to a stereo amplifier and the output level is too high for the input terminals, or too low.
2) When the tuner output level does not match that of other units (turntable, tape deck, etc.) connected to the amplifier. When there is a difference in output levels between AM performance and FM performance.

③ MUTING SWITCH

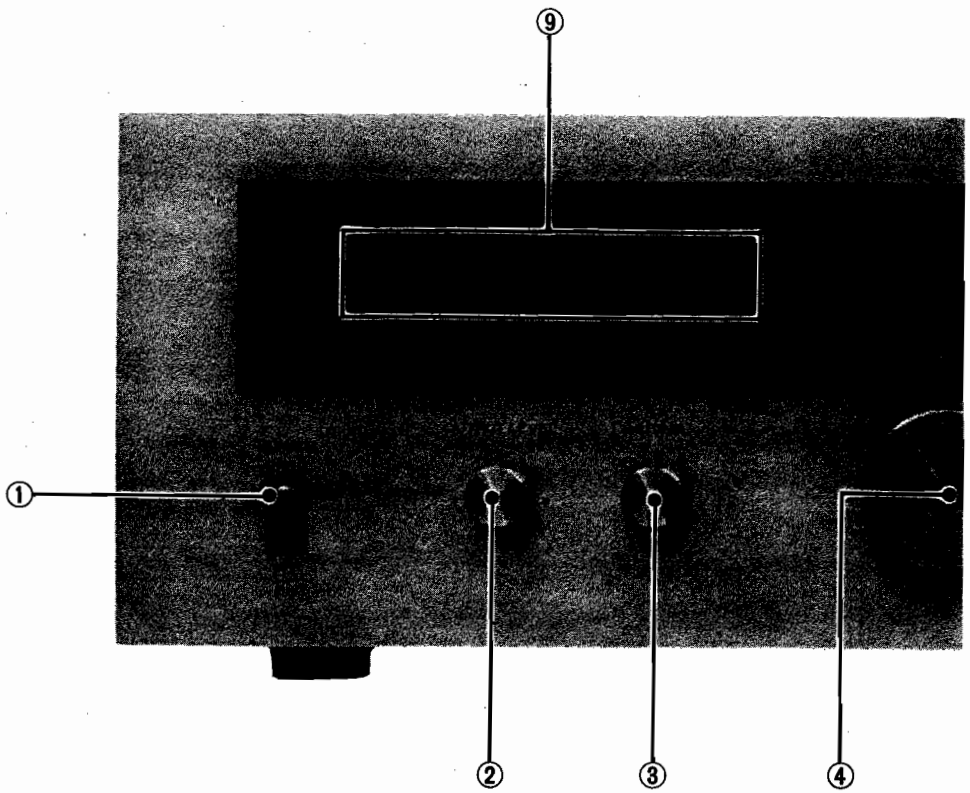
This switch silences interstation noise on the FM band.
The switch positions and functions are as follows:

1: Use this setting when the (2) setting cancels the desired station along with the noise.
2: To tune in a strong signal station.

Note: When tuning to a weak signal station, turn the MUTING switch off. This will not affect the noise, etc., but such interference usually disappears when you are near or right on the station at any rate.

④ TUNING KNOB

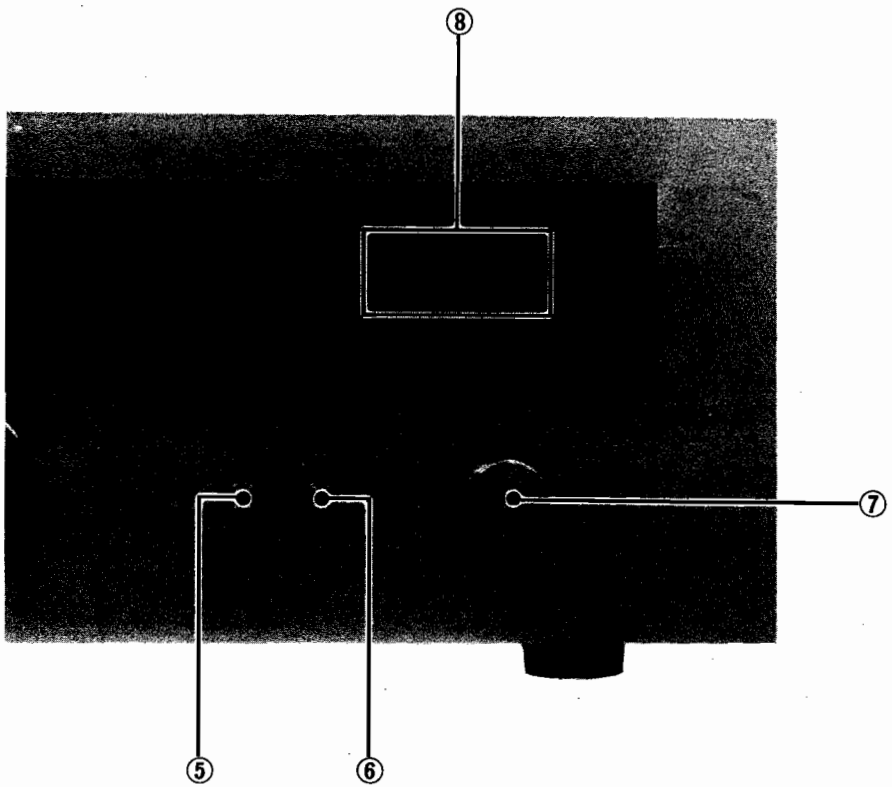
Use the tuning knob to select the AM and FM station desired.
Adjust further by tuning for maximum deflection of the SIGNAL meter while listening to the speaker output.



⑤ IF BAND SELECTOR

Switch positions and functions are as follows:
WIDE — This setting is suitable for normal usage in an area where no radio interference occurs. Reception with a low distortion can be expected.
NARROW — Depress this switch to increase selectivity against interference from a closely adjacent station.

CONTROLS AND THEIR FUNCTIONS



⑥ METER SWITCH

Switch positions and functions are as follows:

BUTTON DEPRESSED – The DEVIATION/MULTIPATH Meter acts as a MULTIPATH Meter.

BUTTON RELEASED – The DEVIATION/MULTIPATH Meter acts as a DEVIATION Meter.

⑦ SELECTOR SWITCH

FM MONO – For FM mono reception.

FM AUTO – For both FM mono and stereo receptions. The tuner will automatically identify and separate FM stereo broadcasts.

When an FM stereo broadcast is tuned in the STEREO indication lights up.

MPX FILTER – Unlike FM mono reception, high frequency noise may sometimes be encountered when receiving FM stereo broadcasts. The MPX FILTER in this tuner effectively cuts such disturbances. This switch has nothing to do with mono reception.

AM – For AM reception.

⑧ DEVIATION/MULTIPATH METER

DEVIATION – Functions as a meter which indicates a peak value of the modulation degree for FM broadcast. This meter makes it possible to monitor the maximum modulation degree for the received FM broadcast signal. If used in combination with the VU meter of the tape deck, an optimum recording level can be obtained.

MULTIPATH – Functions as a multipath detection meter. Reception with a minimum distortion is possible by depressing this switch and positioning the antenna in a direction where this meter gives a minimum deflection.

⑨ SIGNAL/TUNING METER

SIGNAL METER – This meter indicates incoming signal strength at the antenna with correct linearity from the weakest to the strongest signals.

TUNING METER – This meter is used for precise tuning to the center of the FM channel. Turn the tuning knob until meter pointer is at the center of the heavy black area of the meter scale. Center tuning provides maximum separation and minimum distortion.

OPERATING INSTRUCTIONS

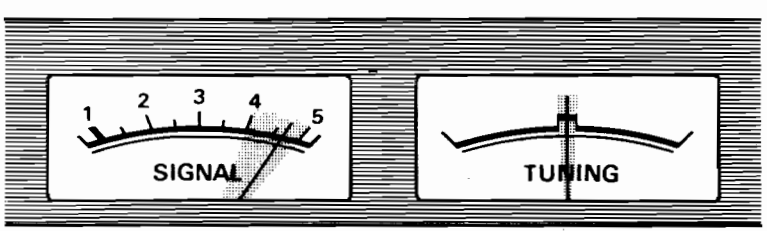
FM RECEPTION

1. Set the Selector switch to FM AUTO.
2. Set the MUTING LEVEL switch to OFF.
   This switch cuts FM noise between stations with an efficiency that varies according to 1 (weak) or 2 (strong) settings. But it also affects reception of weak FM signals, and should therefore be left off except when tuning.
3. Turn the TUNING knob to select a station. First tune so that the SIGNAL meter pointer swings as far to the right as possible, then finish the precise tuning by centering the TUNING meter pointer. If the STEREO indicator lamp lights, the broadcast is in stereo; if not, it is mono.
4. Set the OUTPUT LEVEL knob to its central position.
5. If a stereo amplifier is used, set its controls to the desired volume level and tonal quality.
6. If continuous high-frequency noise occurs during FM stereo listening, set the Selector switch to MPX FILTER.

Note: It may be impossible to eliminate noise from an FM stereo broadcast if the signal is extremely weak. In such a case the relative signal strength can be improved by switching to FM MONO with the Selector switch. While the stereo effect will be lost somewhat, a great deal of the noise can be substantially eliminated in this way.

AM RECEPTION

1. Set the Selector switch to AM.
2. Turn the tuning knob to select a station. Tune in so that the SIGNAL meter pointer swings as far to the right as possible.
3. If a stereo amplifier is used, set its controls to the desired volume level and tonal quality.



SIGNAL METER TUNING METER

GROUND

Broadcasts can be received without a ground connection. However, it is advisable to connect the GND terminal on the rear panel to the ground by using a buried grounding rod or iron-made water pipe to reduce the noise and ensure safety. However, never use a gas pipe for this purpose.

CLEANING PRECAUTIONS

Do not use volatile liquid such as alcohol, thinner, gasoline, benzine, etc., when cleaning the unit surface. Use silicon cloth or soft dry cloth.

PRECAUTIONS FOR SAFETY

- Switch off the unit and disconnect the power plug from your AC outlet immediately if the abnormality (smell, smoke, etc.) should take place.
- When you connect or disconnect the power plug from your AC outlet, never do it with wet hands to avoid unexpected accident from electric shock. Besides, do it by holding the power plug itself, not the power cord.
- Disconnect the power plug from your AC outlet when it begins to thunder terrifically. (It is advisable to disconnect the antenna feeder or coaxial cable from the unit if an outdoor antenna is installed. Do not touch the antenna feeder or coaxial cable disconnected then.)
- The power cord must not be pulled strongly, nor bent forcibly, nor scratched, nor extended by connecting an extra cord. This will damage the cord and be a cause of electric shock and a fire.
- Don not put a heavy thing on the power cord.
- Never dismantle the case from the unit and touch the internal part. Never modify the internal part. Otherwise, the danger of electric shock will be incurred.

BEFORE ASKING SERVICE

When the unit does not operate as desired, it is often considered to have a trouble. In most cases, however, this is attributable to improper connection or improper setting of switch and control. Re-check your unit before asking service, referring to the table below.

SYMPTOM	PROBABLE CAUSE	CORRECTION
Continuous low frequency buzz. Most noticeable at night on weak signal stations. Poor AM reception.	Interference from electrical appliances or atmospherics. In ferroconcrete buildings or in areas remote from the broadcasting station.	Erecting a 10 meter outdoor antenna and securing good ground conditions should reduce interference considerably. Complete elimination is difficult. An outdoor antenna necessary.
Continuous high frequency whine which increases at night.	TV interference. 10 kHz beat interference from adjacent AM station.	Turn TV off. (Neighboring TV set may also be the cause). Impossible to eliminate from tuner side. Use HIGH Filter to cut off high frequency interference, amplifier side.
Intermittent buzzing or sharp cracking noise.	Lightning interference. Interference from fluorescent lamps. AC plug Connection.	Usually unavoidable in certain areas. Occurs when lamps are on and cannot be helped. Try reversing AC plug connections. Occurs only on certain stations due to high voltage power line and cannot be helped in many areas.
Continuous hiss or buzzing interference with broadcast. Becomes louder during stereo.	Incoming signal too weak at ANT terminal.	Erect outdoor FM antenna if only indoor T-type is used. A 5 or 7 element antenna is necessary if you are located at a considerable distance from the broadcasting station.
Occasional sharp buzzing or crackling noise.	Automobile ignition noise. More noticeable on weak signals.	Erect outdoor FM antenna as far away from roads as practicable.
FM Automatic Circuit fails to respond to stereo broadcast.	Incoming signal is exceptionally weak.	Erect an FM outdoor antenna.

RATING

Power Consumption:	22 watts
Dimensions:	W 16-15/16" (430 mm)
	H 5-7/8" (149 mm)
	D 14-13/16" (376 mm)
Weight:	18.7 lbs. (8.5 kg)

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